A DOCTOR'S COMPLETE GUIDE TO THE PENIS–
FROM SIZE TO FUNCTION
AND EVERYTHING IN BETWEEN

INCLUDES
A 5-STEP PLAN
FOR MAXIMUM
PENIS HEALTH

THE PENIS BOOK

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The Penis Book

A Doctor's Complete Guide to the Penis—From Size to Function and Everything in Between

Aaron Spitz, MD, Chief Representative for America's Urologists to the American Medical Association

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This book is for anyone who has a penis or who knows someone who has a penis.

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Introduction

Dick, dong, putz, schlong, peter, johnson, skin flute, trouser snake, Mr. Happy, Vlad the Impaler, aka the penis. The penis as a topic of discussion is immediately provocative. And now you *can* say the word on television. Its likeness seems to pop up just about everywhere these days, whether as an eggplant emoji in a sext or, in its most explicit digital rendition, streaming across Internet porn. Usually the subject of jokes, the penis is often misunderstood, shamed, and just plain given a hard time (although sometimes a hard time is okay). It's time to lift the veil of ignorance and give this vital organ its day in the sun.

As a urologist, it is in my job description to do the dirty work of probing around where other doctors are typically afraid to go. Doctors are people too, and they are often squeamish about discussing sexual issues and concerns about the penis. I know the importance of getting the conversation started because confusion, fear, and even desperation so often surround these topics. I have had the privilege of educating and helping not only thousands of my own patients but many people across the country and around the world through my many television appearances. All the information you will read here is highly accurate and heavily referenced. I am a bona fide expert, serving on guideline committees and reviewing journals for prestigious medical societies, but my true joy is educating people with a lighthearted touch. Call it a spoonful of sugar to help the medicine go down.

When I proposed writing a book about the penis, the question arose: Can you really squeeze a whole book out of that thing? After all, to many it's a body part that makes few appearances and mostly just hangs around until it's time to go to bed. Well, as an expert who has devoted my career to the health and well-being of thousands of penises, I know the penis can be a big topic. But even I was surprised at how hard it could be to stuff all of it into the pages of one book. Working with penises all day long and being the proud owner of one I already have a firm grip on the matter, but in writing this book, I probed even deeper to

give you the most penetrating treatment of the penis that money can buy (at least legally).

Questions, concerns, and fascination about the penis cut across class, race, and gender. Whose is the biggest? Whose is the smallest? Whose is the strongest? Whose is the fastest? Why does it do *that*? Why *doesn't* it do *that*? Is it okay if it does *that*? Is it supposed to look like *that*? What the hell is *that*? And so on. This book answers all those questions and more. *The Penis Book* is organized into three parts to help you master your domain. The first part is all about how it works. You will learn the anatomy of the penis, how there's much more than meets the eye, and how it transforms from Mister Softee into Rocket Man. Another coming attraction is, you guessed it, a section all about coming—too soon, too late, or just in time. This sticky subject is tackled tastefully. But that's not the whole wad. We size things up with real scientific studies of length, width, and performance duration. You may be surprised where you "stand."

I have been asked more times than you can shake a dick at if there really are pills that make one's penis bigger, or devices, or even surgery. The answers are found in Part One. We look at how much of what's advertised is snake oil, and how much is really snake. We take a piercing look at penis bling as well. When it comes to size, the porno penis stands out. We take a candid look at porn to see if it's really all it's cracked up to be.

Turtlenecks versus V-necks is a fashion choice. Circumcision is a lifetime decision. There are both risks and benefits to this widespread practice. The reasons for circumcision range from tradition to prevention or even treatment of a medical condition. Sometimes it's hard to pull back the controversy to expose the facts, but we get inside and underneath this topic, leaving no buildup of uncertainty.

The penis is more than a body part. It is a symbol and an idea that has stood prominently throughout the ages. It has been glorified, envied, feared, and shunned. Part One wraps up with a discussion of the penis in history, politics, and culture.

Now that you know how the penis works, Part Two is all about how to work it and what to do to keep it working. By the time you get your hands on *The Penis Book*, you may already have had some trouble. Part Two teaches you why Mr. Happy isn't always and how to cheer him up. Psychological and physical

causes of erectile dysfunction are explained, and we look at the most effective remedies, from pills to shots to suction to surgery.

Testosterone is the fuel for a man's engine. It strengthens your muscles and bones, puts hair on your chest (but not your head), and plays an important role in sexual performance. Testosterone can boost desire and it can cure depression. It can also increase your life span. But it may do nothing of the sort, if you don't actually need it. Part Two helps you understand how to check your fuel gauge and how to fill 'er up if you are running low.

What you eat is critical to your penis health, and both exercise and sexercise are important as well. Proper diet and exercise can actually reverse erectile dysfunction. Sleep and supplements can play a part. It all comes together in Chapter 16, titled My Five-Step Plan for Maximum Penis Health. You will learn the easy but essential steps to maintaining a strong, healthy penis for years to come. Follow these steps and you won't outlive your penis.

Part Three is not for the faint of heart, but it is for the damaged of dick. In this section we look at the range of things that can go wrong with the penis. You can bend it, you can break it, you can even cut it off and still it can be fixed. Saving Private Ryan is covered in this section. Whereas Part Two gives tips on getting it up, Part Three gives advice for when you can't get it down—a painful situation of too much of a good thing. STDs, infections, rashes, and even cancer are all touched upon (wash your hands), with recommendations for prevention and treatment.

Things can go wrong when the penis is just starting to form. It may not finish forming, or its development can go too far. There can be a mismatch between your genitals and your gender when your "brain sex" mismatches the big head and the little head. We look at the options, including going from an outie to an innie and vice versa.

The penis is an amazing and complex organ. It holds the key to unimaginable pleasure, and at the same time it's a window into your overall health and well-being. The more you know about your penis, the happier and healthier you may be. My wish for you is that this book keeps you up at night.

PART ONE

How It Works

CHAPTER 1

BEDROOM BASICS: How an Erection Happens

W*ood, boner, hard-on*—whatever you want to call it, an erection is a far more complex and amazing event than most common nicknames give it credit for. In fact, a more apt moniker would be *rocket ship*. Although getting a stiffie isn't rocket science, many complex systems must work together for a successful launch. All the elements of a rocket—the super-strong materials, the hydraulic lines, the fuel, the circuitry, and even mission control—exist, in a way, inside your penis.

Three the Hard Way

Let's start with the super-strong materials. The penis is fundamentally composed of three cylinders. Two of the cylinders are situated side by side. They are the ones that make up the shaft of the penis during an erection and they get filled up with blood. The third cylinder is situated right below the first two, and it's where the urethra (pee channel) runs and gives rise to the head of the penis (aka the glans).

The shaft cylinders, also called *corpora cavernosum* (Latin for "bodies filled with hollow spaces") are surrounded by one of the strongest yet most flexible tissues in the body, named the *tunica* (Latin for "long, sleeveless shirt like a tunic"—very fashionable in ancient Rome) *albuginea* (as in *albino*, or "white").

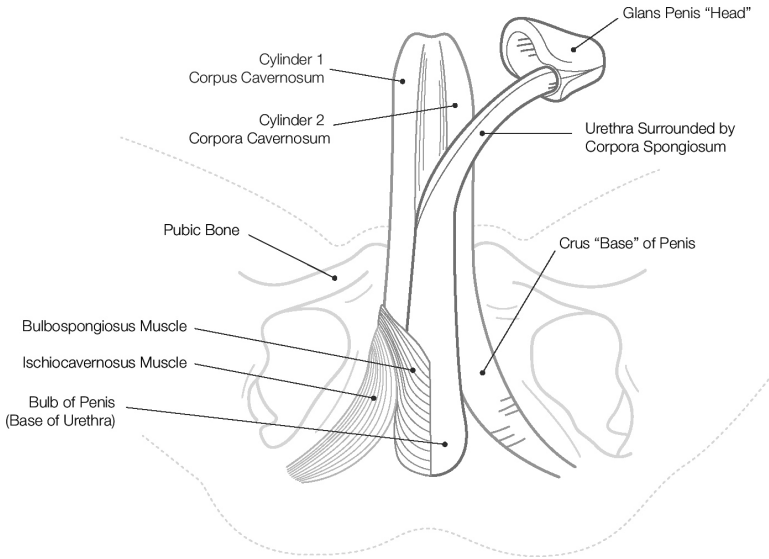


Figure 1 Parts of the penis

Getting Pumped

This special tissue has the amazing property of allowing your penis to expand like a balloon but also become hard like steel. These cylinders fill with blood, not air, and as they fill, they stretch out and expand anywhere from two to five times their original volume. Once they expand all they can, they get more and more rigid, like a tire under pressure.

Those penises on the lower end of the expansion spectrum are the "showers," and those on the higher end of the spectrum are the "growers." Showers tend to look bigger in the locker room but don't change as dramatically as growers when they spring into action.

The veins that drain the blood out of the penis travel through the walls of the shaft cylinders, but as the cylinders expand under pressure, they pinch the veins shut, trapping the blood in the erect penis. The pressure inside the shaft rises higher than the blood pressure in the rest of the body, and additional blood can no longer be pumped into the penis.

But it gets even more intense. At the base of all three of the cylinders are special muscles (*ischiocavernosus* muscles) that surround and squeeze them. When these muscles are squeezing,

that pressure shoots up even higher, giving you the throbbing love pump you know and love.[1]

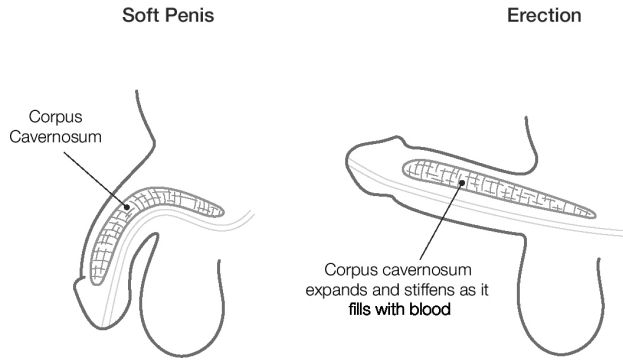


Figure 2 An erection occurs when the chambers of the penis fill with blood.

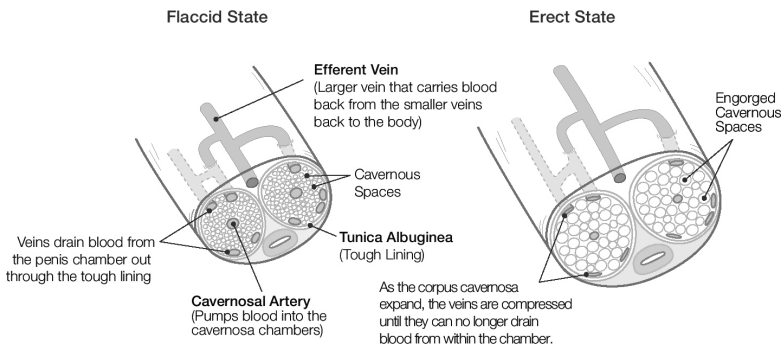


Figure 3 Expanding chambers squeeze veins as an erection increases.

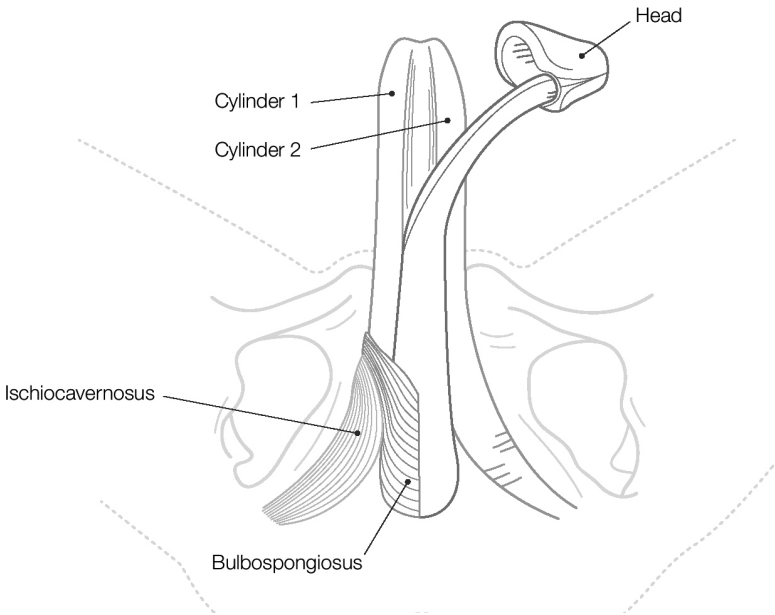


Figure 4 Muscles that squeeze the penis

The Shaft

So what makes the shaft of the penis so tough? The special material lining the cylinders, the *tunica albuginea,* has a structure that is unique in all the body. At the microscopic level one can see that it is made of collagen fibers, the same tissue that gives our skin, blood vessels, and tendons their strength and integrity. But unlike in those structures, the collagen is specially arranged into wavy bundles that circle the cylinders. That circular layer is surrounded by another layer or two of long, straight collagen running lengthwise along the cylinders. All these collagen fibers are interwoven with about 5 percent elastic fibers as well, kind of like the waistband of your underwear. The final result is the elasticity plus strength that leads to lengthening, widening, and then rigidity with remarkable toughness. The fully pumped penis doesn't bend or buckle at ramming speed.

The lining of the third cylinder, the *tunica spongiosum*, which contains the urethra and is capped off by the head of the penis (glans), doesn't have that same multilayered arrangement of collagen.[2] It stretches but does not get rigid like the shaft. Good

thing, too, or you wouldn't be able to pee with a boner because all that pressure would pinch the pee channel shut. It's already trouble enough peeing when you are "standing at attention," trying not to hit the upraised lid of the toilet. Imagine if you couldn't pee at all! Now it's true that it's hard to pee right after sex, but that's a different issue that I'll explain in the next chapter.

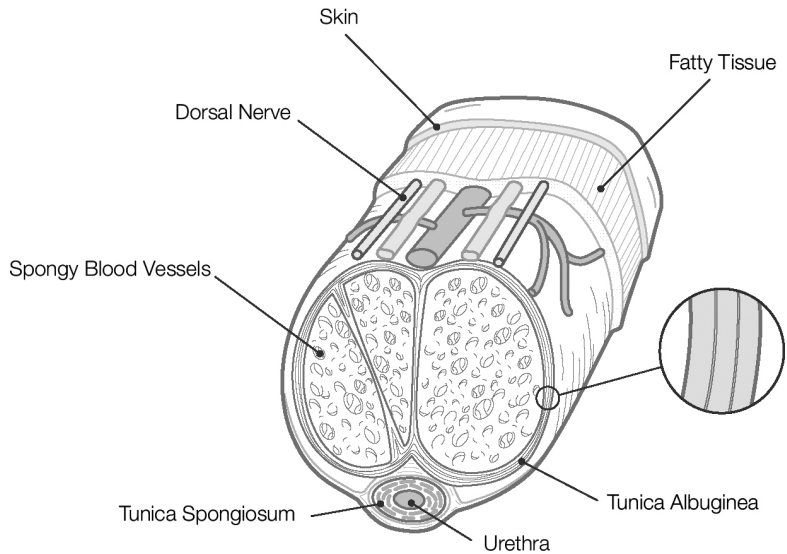


Figure 5 The tough lining of the penis chamber

Circulation

Your blood vessels are the hydraulic lines of your pocket rocket. The arteries that pump blood into the penis branch off from larger arteries that go to your pelvis and your legs. These smaller branches run under the edge of your butt bones—the ones you sit on—and then continue on to the bases of the cylinders of your penis, which are anchored to the underside of your pubic bone.

Here's a remarkable fact: Your penis is anchored just as far back inside you as what you see dangling outside of you. (That's right, your penis is twice as long as you thought it was, and maybe actually as long as you said it was!) Those "penis" arteries are among the smaller arteries in the body at barely 1 millimeter in diameter at best. Compare that to the arteries that provide

blood to the heart—the coronary arteries, which are the ones that get blocked up when you get a heart attack. Those coronary arteries are about five times wider in diameter, so it's easy to see why, when we get older and our blood vessels get narrower, the ability to have an erection is usually the first thing to go. And when it goes, it's often a warning sign of heart disease. But for the healthy penis, those narrow arteries work just fine.

The penis arteries each split into three branches that penetrate into the base of the shaft cylinder on either side, as well as the spongy cylinder surrounding the urethra that gives rise to the head of the penis. The third branch runs on top of the shaft and gives blood to the skin and fat of the penis as well as the head of the penis.[3]

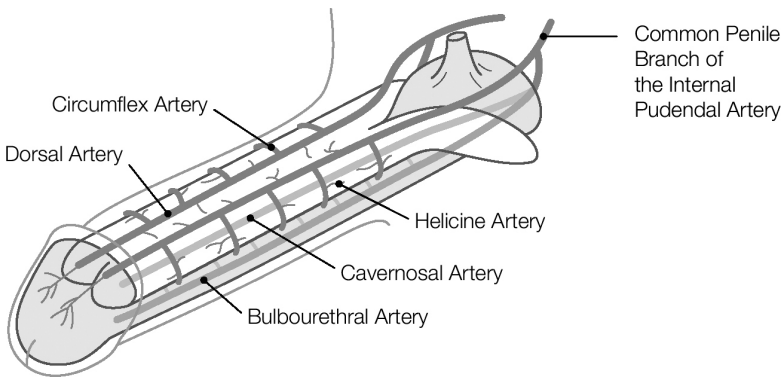


Figure 6 Arteries of the penis

Let It Flow

While there is always blood flowing to your penis through these arteries, when you have an erection, the bloodflow increases. The reason that bloodflow can change is because the arteries have a muscular lining that can squeeze closed to slow down the bloodflow, like when you turn off a faucet. Or the lining can relax, allowing the blood vessel to stretch open wider, like when you open up a faucet.

The narrowing and widening of this muscle layer is controlled by special nerves that are not under your conscious control. They are called *sympathetic nerves*, and they are constantly at work, like traffic cops, directing the bloodflow throughout your body.

Sympathetic nerves run all along the wall of every artery in your body, not just those in the penis. These nerves release adrenaline (and its cousin noradrenaline) into the muscle wall of the arteries, which makes them open up or close down more, depending on which part of the body they are in.

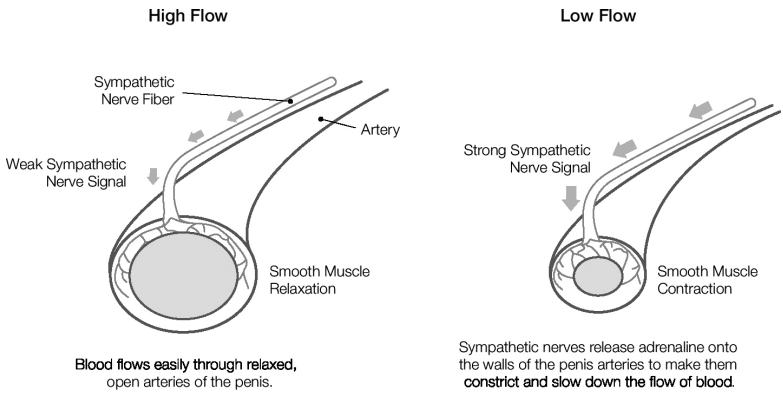


Figure 7 Sympathetic nerves decrease bloodflow to the penis.

Adrenaline!

Adrenaline is also released into the bloodstream by the adrenal gland, a yellow fatty globule that sits on top of the kidney. Adrenaline prepares your body to survive danger. It makes the blood vessels to your muscles, liver, heart, and brain open up more to preserve these vital structures but clamps down on the smaller blood vessels in your less vital parts like fingertips, toes, and—you guessed it—your penis. Adrenaline makes the heart beat faster and the lungs expand more, but it kills your erection.[4] Effectively, an adrenaline rush makes your body sacrifice the little head to save the big head.

An adrenaline rush can occur from your perception of real danger, from imagined danger, or even just from stress or anxiety. Your penis will not know the difference. If a saber-toothed tiger were chasing your ancestor, he got an adrenaline rush and lost his erection. If you are worried that you won't get an erection because you had trouble the last time, you will get an adrenaline rush and lose your erection. Your penis doesn't know if it's life or death or just embarrassment. On the other hand, when there is no danger or anxiety, the sympathetic nerve traffic

cops back off and open up all lanes and let the blood flow freely to your fingers, toes, *and penis*.

Miracle Sponge

For an erection to occur, the most important of the arteries is the middle branch of the penile artery that enters the shaft of the penis. This artery runs up the center of the shaft, giving rise to countless tiny side branches, which each lead to countless tiny little cavities that fill up with blood. If you look at it with the naked eye (as I do routinely during surgery), this inner part of the shaft looks like a very delicate sponge. These tiny spaces of the "penis sponge" have an amazing design that is the actual engine of your love missile.

Each of these spaces is lined with two special layers. The first layer, which is in contact with the blood directly, is called the *endothelium*. It's made of cells designed to keep the blood from clotting even when it's trapped in the erection and not flowing much. If the cylinders were just empty, without these layers, like two balloons, the blood would fill in, settle, and then coagulate into clots that couldn't drain out. The penis would eventually die off, and that would be the end of that. The second layer is *smooth muscle*. This extremely thin layer of muscle cells can relax and stretch thin, which lets the spongy spaces fill up with more and more blood, increasing the pressure on the cylinder, pinching off the veins, trapping the blood under pressure, and causing an erection. But this same layer can contract, squeezing out the blood and making the erection go down, or not allow much blood to come into the spongy spaces in the first place, and hence prevent an erection.[5]

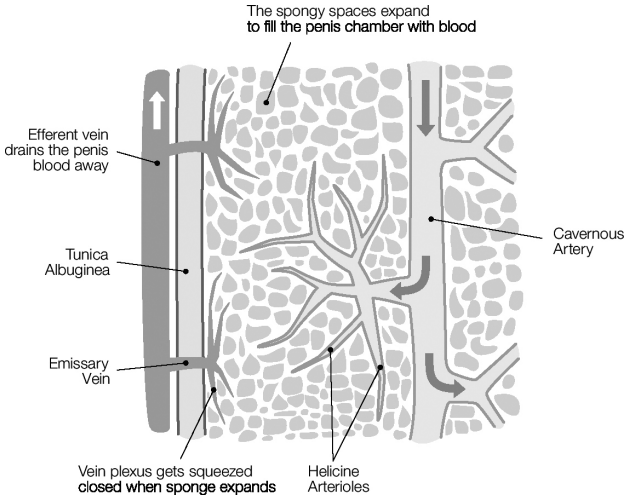


Figure 8 Vascular sponge within the penis chambers

Some Nerve You Have

These smooth muscles are triggered by a second set of nerves called *parasympathetic nerves*, which are also not under your conscious control. These nerves cause the smooth muscles to relax, opening up the spongy spaces and allowing more blood to rush in and pump up the penis. These nerves run in the pelvis between the prostate and the rectum before they enter the base of the penile shaft. The sympathetic nerves, which trigger the smooth muscles to close down the flow of blood to the penis, and the parasympathetic nerves, which trigger the penis to open up, are in a constant and epic battle for control of Mr. Happy.

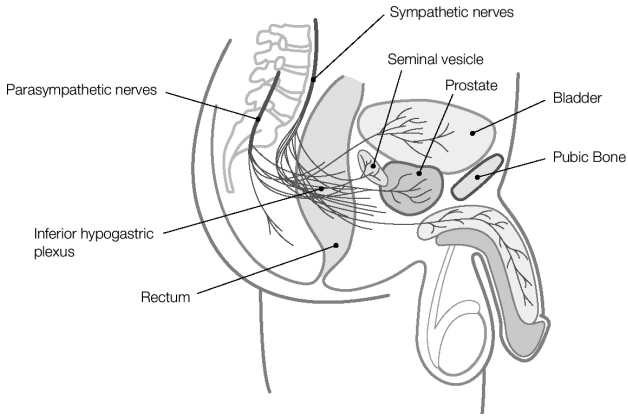


Figure 9 Parasympathetic Nerves and Sympathetic Nerves

Just Say NO

What do dynamite, hot rods, and your erection all have in common? Well, besides the obvious, they all produce *nitric oxide*. So, if the spongy tissue of the penis is its engine, then nitric oxide is its fuel. Nitric oxide (NO) is a by-product of nitroglycerine, which is what dynamite is made from. NO is also a by-product of nitrous-burning drag racers. And believe it or not, in your body, it's made primarily to increase the flow of blood. It is so critical to your circulation (and therefore to your penis) that in 1992 it was named the Molecule of the Year, and in 1998, NO researchers were awarded the Nobel Prize.

NO is what actually causes the smooth muscles of the arteries and of the small, spongy spaces of the penis to relax and let the blood flow into the penis. The parasympathetic nerve endings release this critical molecule right onto the surface of these smooth muscle cells. At the same time, the special cells that line the spongy spaces of the penis (endothelial cells) also pump out NO molecules towards the smooth muscle cells right next to them. The NO lasts for a short time in the smooth muscle, where it sets off a chain reaction that prevents calcium from entering the cell and sweeps it up from inside the cell, hiding it away in a part of the cell called the *endoplasmic reticulum*.

With less calcium floating around inside the cell, the smooth muscle fibers inside that cell can relax and stretch, which makes the spongy spaces open up wide so that blood can rush into the

penis and pump up the erection.[6]

NO is also the secret to Viagra and other pills, including Cialis, Levitra, and Stendra. All these pills work by making the penis's natural supply of NO have a longer-lasting effect, so the smooth muscles will relax more and allow more blood into the penis. Normally the effects of NO are eventually counteracted by a special enzyme in the penis called *phosphodiesterase (PDE)*.[7] If PDE didn't shut off the stimulating effects of NO, a guy would have an erection that wouldn't go down. These pills play defense for your erection. They block some of the PDE that is trying to prevent or shut down the erection. They, therefore, let NO last longer, allowing more blood to flow into the penis.

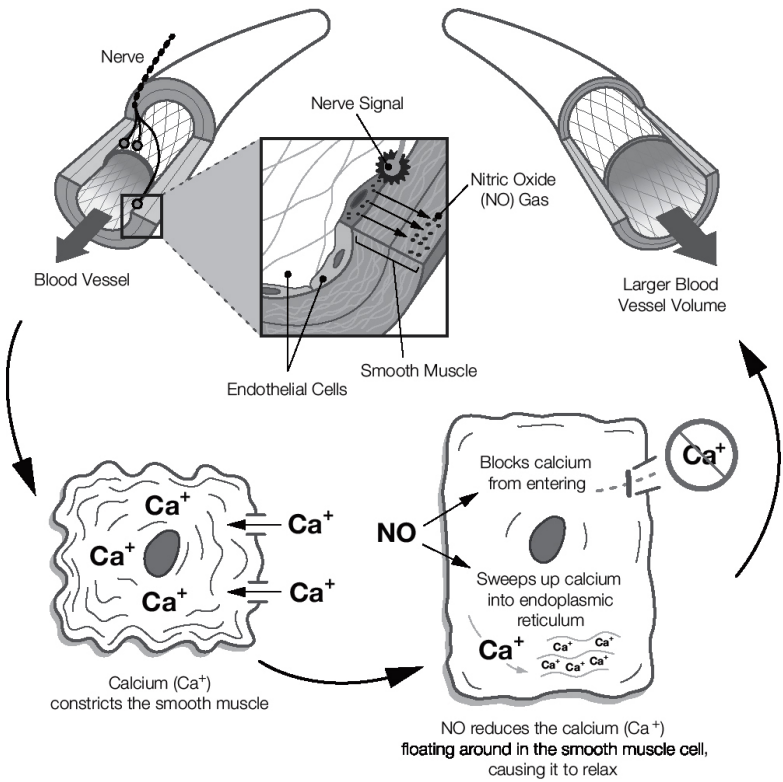


Figure 10 Nitric oxide causes bloodflow to increase by relaxing the blood vessels.

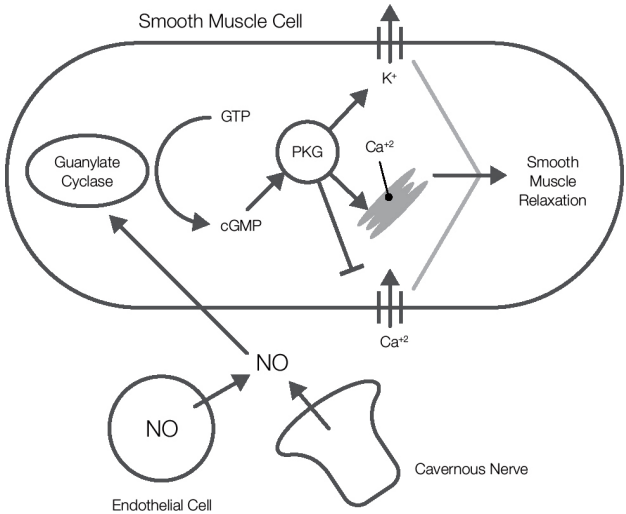


Figure 11 Nitric oxide makes smooth muscle cells relax by blocking and storing away calcium.

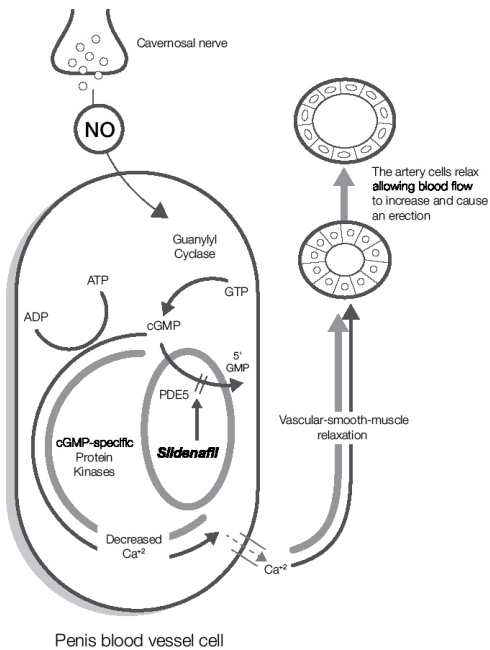


Figure 12 Penis pills such as sildenafil (Viagra) block PDE5 (phosphodiesterase). This keeps calcium levels low so the cell stays relaxed and the erection lasts longer.

Little Head versus Big Head

Okay, so now you know how the rocket works, but who's really flying it? Doesn't it often seem like the penis has a mind of its own? Well, it sort of does and it sort of doesn't.

Once again, like a rocket, there are control centers on board and, remotely, at "mission control." These regulate the launch, the thrusters, and the splashdown (pun intended) of your erection. Some erections are caused without any input from your conscious mind. These are due to reflexes in reaction to sensations. There is a nerve circuit that transmits stimulating sensations from the nerve endings in your penis, through nerve fibers that run along the edge of your butt bones (the ones you sit on, the same ones the artery to the penis runs along), to the base of your spine. Some of those signals get sent up the spine to your brain for further processing, but some just get handled right there and then, below the belt, as a reflex. In this case, the sensations coming to the base of the spine from the penis trigger a parasympathetic nerve to fire back at the penis, which releases the magic NO and causes an erection. This is why foreplay helps you get it on, but it's also why you might get an erection even though you weren't planning on it, such as when you get called to the blackboard wearing tight blue jeans in geometry class or when you pull into your parking spot at work after a smoothly vibrating drive. Even men with spinal cord injuries who feel no sensation whatsoever from their penis can get erections purely via this reflex.[8]

Mission Control

In addition to this "onboard computer" reflex, there is a lot of signaling going on between Major Tom down there and mission control up in your brain. All your senses from all your nerve endings are constantly feeding information to your brain, which gets processed at several levels—some conscious, some subconscious, including some so basic there is no conscious control, such as the centers that control the beating of your heart.

Nerve centers at each of these levels can launch or scrap an erection. They coordinate their signals, and if it's go time, they send launch signals through the parasympathetic nerves that run

down the length of the spine and exit at the bottom into the pelvis, where they connect to shorter nerves that travel between the prostate and the rectum and then enter the penis. If it's no-go, they send signals that suppress those parasympathetic nerves through the sympathetic nerves, which run along the outside of the spine down to the blood vessels of the penis, releasing adrenaline to squeeze off the bloodflow and scrap the launch.

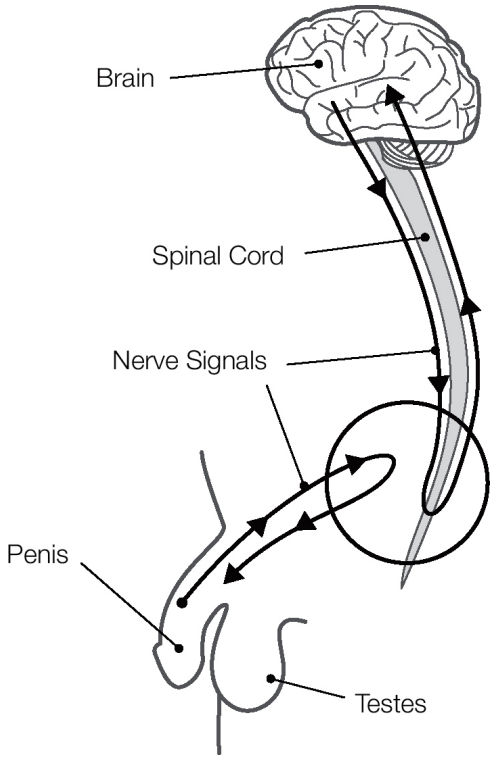


Figure 13 Nerves in the brain, spine, and penis all coordinate to produce an erection.

The Ignition Switch

Most commonly we rely on all of our five senses to stimulate an erection. For most men, sight is a key sensation. Pleasing erotic images come in through your eyes, whether live (best) or not, and travel to the back of your brain, where visual images are processed. From there, the signals bounce all around your brain, picking up associations from memories good and bad and then

diving deeper to parts of your brain out of conscious control.[9] In the process, key parts of the brain are triggered to release powerful chemicals called *dopamine* and *oxytocin*. These chemicals directly and indirectly trigger other brain centers to send signals down your spine through those good old parasympathetic nerves, which then release the NO in the penis to cause liftoff.[10]

But it's not just your eyes that are involved; it's your ears, your skin, your nose, and your tongue too. Even your guts and bladder can get involved. The more appealing the sensations that come in through your senses, the more those brain centers are stimulated to trigger your erection. It's like a systems check prior to launch: "Beautiful smile—check; thrilling touch—check; intoxicating scent—check. All systems go!"

But not all sensations may be appealing. A harsh sound or an unpleasant smell (or taste for that matter) can scrub the mission. These unpleasant signals will trigger other parts of the brain to override the signal to release dopamine and oxytocin. Instead, signals will be sent to stimulate the sympathetic nerves to stimulate an adrenaline rush from your adrenal gland. This adrenaline reaches your penis in the bloodstream and, along with the adrenaline that the sympathetic nerves themselves release directly onto the surface of the blood vessels, shuts down the flow of blood to your penis, aborting takeoff.

Just like NASA, your mission control has both backup and safety systems. Even without the signals from your senses, your brain can generate the signals necessary to launch your erection from sexual fantasies, other thoughts, or memories alone. Various brain signals can trigger the release of the sex hormone testosterone.[11] Testosterone positively reinforces the feeling of desire. It also keeps the tissues of the penis flexible and healthy, allowing for a better erection.

Brains Rule

In spite of all these possible ignition switches, our brain actually overrides the launch most of the time. Our deep brain, which runs our basic vital systems without conscious control, also has nerve centers that send signals down the spine and throughout our conscious brain, releasing a potent chemical called *serotonin*.

Serotonin blocks the parasympathetic nerves to the penis that otherwise would stimulate an erection and shuts down the pro-boner activity of oxytocin in the brain. Serotonin, however, is also important for maintaining a normal mood, and that is why many anti-depressants work by boosting it. The downside is that people who take these kinds of antidepressants may experience some difficulty getting an erection, as well as a loss of sexual appetite.[12]

At the more conscious level, our frontal lobes (where we process judgment, sexuality, and a host of other complex functions) and our temporal lobes (where we process emotion and language) are continuously sending signals to suppress sexual behavior and erections. This may be why when you sleep, and those centers are off-line, you get frequent erections; you may even wake up with one (morning wood). In the rare instances in which people have had a disease that has injured or required the surgical removal of these parts of the brain, they may become so hypersexual that they act aggressively or inappropriately, constantly seeking sex or masturbating to the exclusion of other normal life routines.[13] It seems that our brain prevents us from blowing ourselves up sexually, instead reserving the launch for the appropriate window of opportunity.

The more you know about how an erection works, the less anxiety you will have about it and the more you will be able to troubleshoot anything that goes wrong. And the more you understand about all the processes that come into play, the more you will value healthy practices that help you maintain the proper function of all these systems to ensure successful moon shot after successful moon shot after…

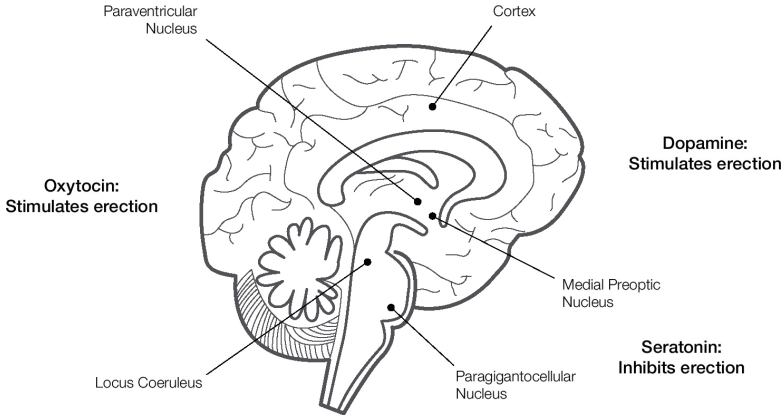


Figure 14 Deep brain centers that control erection

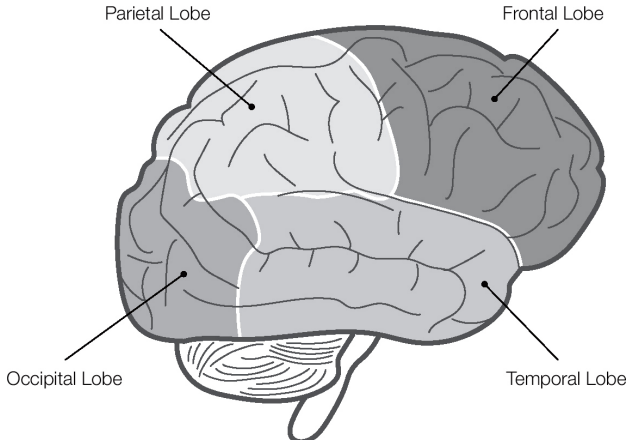


Figure 15 Conscious control centers of erections

CHAPTER 2

COME AND GET IT: Ejaculation and Orgasm

Ejaculation and orgasm can be sticky topics. There is much that we know, but much that we don't. From wet dreams to hand creams, the triggers for orgasm and ejaculation in the male are varied and often mysterious. Newsstands are filled with magazines touting the latest and greatest orgasm technique for women, but rarely is any attention given to what makes men tick-tick-tick-boom. This chapter explains how come men come and why they come too soon, too late, or not at all.

How Come?

When it comes to coming, two heads are better than one. The little head (between your legs) and the big head (on your shoulders) both generate key signals that jump from nerve to nerve, zipping along to meet in a specialized part of your lower spine known as the "spinal ejaculation center." The spinal ejaculation center, as you might suspect, is what pulls the trigger to fire off the big guns. It's like a launch key because only a very specific combination of signals can activate it successfully. Here's what has to happen.

From the penis, sensations of touch, pressure, and vibration enter their "launch sequence"; this is compared with sequences generated by the rest of the sense organs sending information to the big head. Sight is one of the most important senses for arousing a man. Erotic images are not the same for all guys, either. From a close-up view of pulsating genitals to a chance glance at the nape of your partner's neck, the visual cue that sets you off can be uniquely your own. Simultaneously, other sensory

stimulation is flooding in: lusty, musty erotic smells (is that latex?), erotic touches (light brushes, deep massage, or perhaps a spanking), erotic sounds (breathing, moaning, or dirty talk), and erotic tastes (salty skin, wet lips, or perhaps some drizzled honey). But that's just five simple senses. Add to the mix the fantasies, thoughts, and memories all bouncing around the cerebral cortex, making all kinds of interesting connections.[1, 2]

A deep part of the brain that functions without our conscious thought releases sex hormones and other specialized chemicals that are also a part of the launch sequence.

The hypothalamus and pituitary gland are deep-brain parts sitting below the cerebral cortex, near the center of the brain. If you rammed a pencil up your nose, you could hit them. They release hormones into the bloodstream that trigger the testicles to produce both sperm and testosterone. Testosterone circulates back to the brain, where it stokes the fire of sexual desire. It makes things look, smell, taste, feel, and sound sexier! It also triggers sexual thoughts and fantasies. This deep-brain center also releases a wonderful hormone called oxytocin. It's often referred to as the "love drug." Oxytocin makes people want to cuddle and bond. It reinforces positive feelings in the brain and it directly triggers the spinal ejaculation center. A third trigger from this brain center is dopamine. The more dopamine, the faster you recover after an ejaculation and can go for seconds or thirds (ah, youth!).

So all these signals and chemicals and hormones are promoting ejaculation. No wonder it can come on fast! But there is a part of the brain that puts on the brakes, and it sits at the very base of the brain, or its "stem," just before it connects to the spine. This area, called the *medulla*, is so critical and so fundamental that it controls breathing and circulation and, interestingly, ejaculation. This is where serotonin gets released. Like oxytocin, serotonin makes you feel good, but in a different way. Unlike oxytocin, it blocks the spinal ejaculation center. Many antidepressants work by increasing the serotonin in your brain, which makes you feel happier but can have the side effect of interfering with sexual climax. [3, 4]

Other shutdown signals include distracting stimulations or thoughts. For most people, once the train has left the station, it usually stays on track, but performance anxiety about reaching a

climax can oversensitize the brain to distractions. An unexpected noise or an unwelcome smell may derail your speeding locomotive of love. An intrusive thought, perhaps about work, can pop up and turn the sizzle to fizzle. However, there is a point of no return that scientists call “ejaculatory inevitability.”[5] At this point the sympathetic nerves running down the spine into the pelvis, take over and release adrenaline which is what actually “cleans the pipes.”

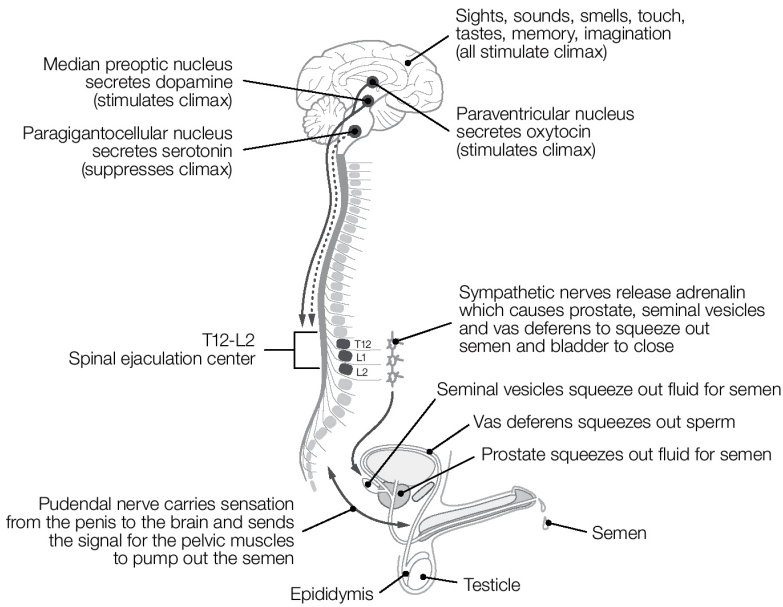


Figure 1 How climax is stimulated

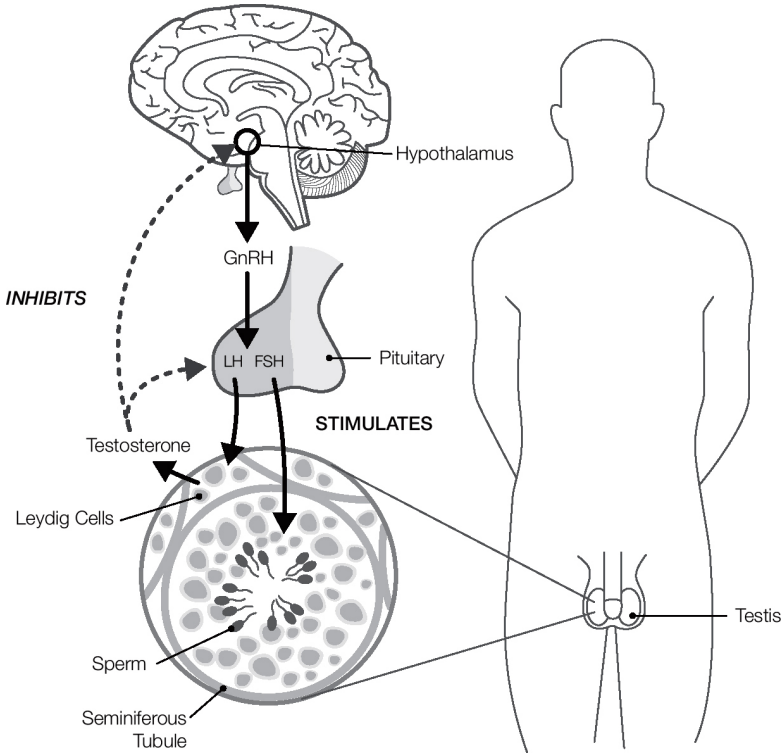


Figure 2 Deep brain control of testosterone

Get a Load of This!

Let's get an up-close look at what happens during ejaculation (you might want to put on some safety goggles).

Semen, *the* elixir of life, is a cocktail made from a shot of sperm and two mixers. At only a fraction of the size of a red blood cell, sperm has only one purpose—to inject your DNA into an egg. Now, the little guys may not always get to serve that purpose, but they don't have to know. Let them dream. Sperm is only about 10 percent or less of the volume of semen. Most of the fluid is actually from other glands next to the urethra called the *seminal vesicles* and the *prostate*. This combination of fluids is essential for the sperm on race day.[6]

Preparations for the big race actually start a couple of months beforehand, back in the testicles. The testicles are firm and smooth on the outside but soft and squishy on the inside, where

they are filled with tiny tubes that act like miniature conveyer belts where sperm are assembled. The tubes are more than three football fields long if stretched out end to end. (I don't recommend trying it—just take my word for it.) The freshly minted sperm move out of the testicle and into the "swimming camp" known as the *epididymis*. It's a big class at 375 million new sperm a day. Camp Epididymis is a tightly coiled tube, like a silly straw. You can feel the epididymis through the scrotum. It feels like a lumpy, bumpy ridge on the back of the testicle. It's a structure that many guys mistake for a cancer when they notice it for the first time. The sperm will take about 2 weeks to make it all the way through, transforming from couch potatoes to Olympians as a series of chemical reactions activates their tiny tails.

Once they learn to swim, the sperm emerge into the high-speed rail line of the *vas deferens*. The vas deferens is where the tube that was the epididymis gets a lot wider in diameter and becomes surrounded by dense muscle fibers. You can feel the vas deferens through the scrotum. It feels like a thick strand of al dente spaghetti. There can be a lot of long, squishy-feeling things in the scrotum but the vas deferens is distinctly firm and straight. The vas deferens has the most muscle for its size of any structure in the body. Instead of pumping iron, the vas deferens is pumping sperm. Those dense muscles surround and squeeze the tube in rapid waves to propel the sperm all the way up to the base of the urethra, where they enter through a small passage called the *ejaculatory duct*.[7] (When the vas deferens is blocked by a vasectomy, the volume of ejaculation is only slightly less.) Also attached to this passageway are the *seminal vesicles*, small sacklike glands (*vesicle* is Latin for "sack") under the bladder, next to the prostate. They make a yellowish fluid chock-full of power-ups for the sperm. These include amino acids, citrate, phosphorus, potassium, enzymes, flavins, phosphorylcholine, prostaglandins, proteins, vitamin C, and fructose. This Powerade accounts for about 70 percent of the volume of semen.[8,9]

The third ingredient of the semen cocktail comes from the prostate. The prostate is a walnut-sized gland that surrounds the urethra (the urine passageway of the penis), right outside the bladder. It's like a thick tunnel. It is situated about midway between the anus and the back of the scrotum. It can be felt

through the rectum. It's a tough place to reach so it's usually the doctor that checks it out during a rectal exam. This isn't a lot of fun, but in the context of sex it can be quite the opposite. The prostate has been hailed as the male G-spot. It can be stimulated through the rectum or through deep pressure on the skin of the perineum, also known as the "taint" ('tain't the balls and 'tain't the ass). The prostate produces watery whitish fluids that are dumped right into the urethra to join the sperm as well. The prostate secretion contains specialized ingredients that transform the semen from liquid to solid to liquid again. Acid phosphatase, citric acid, fibrinolysin, prostate-specific antigen, proteolytic enzymes, and zinc set off a cascade of reactions that cause the semen mixture to clump after it is spurted. This is a really amazing feature of semen, because by becoming gooey like snot, it won't just run right out of the vagina when the woman stands up so it prevents the sperm from sliding out. About 15 to 30 minutes later, an even more amazing thing happens. The prostate fluid enzymes then cause the semen to liquefy once again so that the sperm, now closer to the egg, can once again swim free to the finish line.[10,11]

If semen is a cocktail, the maraschino cherry is the clear, sticky droplet that is secreted ahead of the ejaculation. It comes from the small sacks that dump into the urethra just past the prostate, right at the base of the penis. This secretion mixes with mucus from small ducts along the urethra of the penis known as Littre glands. This fluid is often referred to as "pre-cum." I like to call it the scouting party. It probably provides a little lubrication.

The mixing of the semen cocktail in the urethra is called "emission." It happens moments before the actual spurt of fluid out of the tip of the penis, and even though all three structures—seminal vesicles, vas deferens, and prostate—are squeezing their contents into the urethra, this is not why the semen spurts out of the tip of the penis. Rather, emission just gets the fluids into the base of the urethra for the next leg of the race—ejaculation. Okay, now it's time to grab that hand towel. Here we go. There are muscles at the base of the penis that surround and squeeze the urethra to pump out the semen. These muscles are called the *bulbospongiosus* and the *ischiocavernosus muscles*, and they are triggered to squeeze and release, squeeze and release at a rate of a little less than once a second for only a few contractions. These

contractions are what most men associate with a primary source of pleasure during orgasm. At the exact same time that these muscles are pumping the urethra, the bladder closes shut so the semen won't be pumped the wrong way into the bladder but rather shoot out the urethra. This is why sometimes it can be hard to pee right after sex. The testicles also get pulled up high and tight as if in "sport suspension" mode, and occasionally it can be uncomfortable.[12]

As men pass the threshold of middle age, their pelvic floor muscles become weaker and less semen is ejaculated with less force—even down to none at all. Also, the seminal vesicles tend to empty less completely and may become partially blocked by the prostate gland as it enlarges. These are normal consequences of getting older.

Even in younger men, the force and volume of ejaculation are variable and depend on a few factors. General health, hydration, pelvic floor strength, hormone balance, and level of arousal all play a factor, but there is a natural variation from one man to another. Whether you are an Uzi or an oozer, the critical issue is getting the semen into the vagina—this is called "intromission," not to be confused with "intermission," which happens in my house when the kids come barging into the bedroom. Although the money shot so commonly depicted in pornography involves high-volume, high-pressure "glazing," the pleasure of climax is typically not associated with the volume, force, or trajectory of ejaculation. Furthermore, there really is no way to directly control ejaculation as it is happening since it is a reflex. If you have both pleasure and a wet spot when you want it, don't look a gift penis in the mouth. There are several conditions where this is not the case. For many it happens all too soon, for others it may not happen soon enough, or there may be pleasure but no ejaculation or ejaculation with no pleasure. Fortunately for most of us, ejaculation and orgasm go hand in hand, or penis in hand as is often the case, reminding us just how great it can be to be alive!

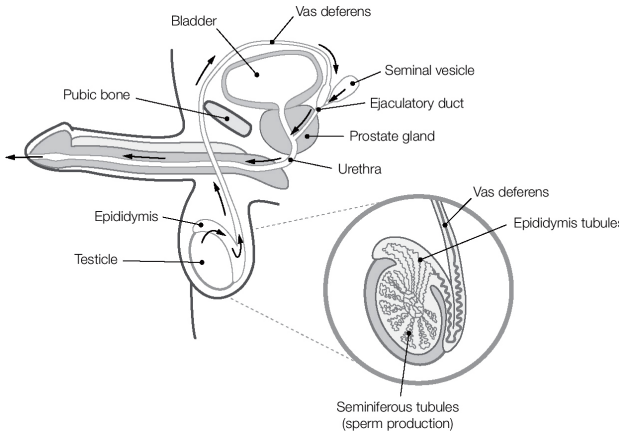


Figure 3 The pathway of semen

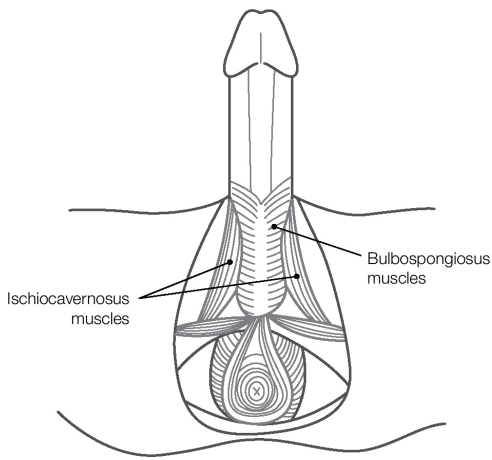


Figure 4 Pelvic muscles around the penis

The Fast and the Furious: Premature Ejaculation

By now, unless you have been living under a rock, you know that a lot of men suffer from erectile dysfunction. You've seen the ads on TV. But a whole lot more men actually suffer from another sexual ailment that's not advertised on TV, and that's rapid or "premature" ejaculation. Premature ejaculation is reaching a climax and ejaculating before you or your partner desire it,

typically within just a minute or two of starting. It's a widespread ailment that some men are born with and some men develop later on. It can be as infuriating as erectile dysfunction and in many cases it happens *because of* erectile dysfunction. The reason it happens is complex and can be physical, behavioral, or a combination.

In many cases a man's spinal ejaculation center is simply wired for speed. Maybe in primitive times, when saber-toothed tigers roamed the land, ejaculating quickly allowed us to get in and get out before we got eaten. But these days sex isn't just a matter of survival. So what's a caveman to do? Well, fortunately there are several remedies ranging from behavioral "sexercises" that reset the nervous system to topical sprays that reduce oversensitivity of the penis to pills that work at the level of the brain and spine.

How fast is too fast? Studies indicate that the average duration of intercourse is about 5½ minutes.[13] In case you were wondering, these studies are done with stopwatches held by the partner—now that's what I call performance pressure. If sex is over in under 2 minutes and it bothers the couple, that's too fast. This condition affects almost 1 in 4 men.[14] Most men with lifelong premature ejaculation come within 1 minute or less. These guys may have an underactive response to the secretion of serotonin, which is the main chemical that puts the brakes on the spinal ejaculation center.[15, 16]

Some men become premature ejaculators later in life in order to finish before they lose their erections. Treatment of the erection problem can fix both problems. Anxiety itself can cause a guy to fire off too fast. Anxiety causes you to release adrenaline and noradrenaline, the very same chemicals that stimulate your seminal vesicles, prostate, and vas deferens to squeeze their parts of the semen into the base of the urethra. This sensation of squeezing and the pressure of semen building up in the urethra then can trigger the reflex to ejaculate. Guys with high levels of anxiety may improve with stress management techniques including meditation. An overactive thyroid mimics anxiety and this can also occasionally aggravate premature ejaculation.

Premature ejaculation may be improved with special exercises and techniques. The pelvic muscles that squeeze the base of the penis and urethra during ejaculation can be trained with Kegel

exercises. A Kegel squeeze is simply clenching the muscles around your anus and urethra that you would clench when you are trying to stop yourself from urinating or defecating. But instead of waiting for that emergency, you do the squeeze on purpose and repeatedly. You may do bursts of quick squeezes in succession and you may do longer holds with more time in between. The more you work those muscles, the more in touch you may be with the sensations of impending ejaculation as those same muscles are being triggered. Getting an earlier warning may enable you to relax and bring yourself back from the brink. In a study with not only Kegel exercises but a pelvic physical therapist providing electrical stimulation to the area to squeeze the muscles directly, more than 80 percent of men were able to triple how long they could last, from an average of 39 seconds to an average of 146 seconds, and the results lasted long term.[17]

A very effective sexercise that can allow you to reset your reflex to take longer before you reach the point of no return is known as "stop-start."[18] The way this works is you or you and a partner stimulate your penis, make it hard, and get yourself close to coming but just before you reach that threshold you stop, cool down, and then try again. Over time you learn to last longer and longer and eventually graduate from the hand to the real thing. Here again, you practice going longer and longer, withdrawing just before the point of no return. It takes patience, understanding, and some degree of self-control. In some modifications of this technique you or your partner squeezes the head of the penis firmly to cause enough of a distracting sensation to bring you down from the precipice of climax before you go over the edge.[19] If you are willing to stick it out (and in and out again), these techniques can be very helpful.

Not everyone has the patience or the partner for behavioral techniques, and even if they do, they don't work for everyone. Medications can also be very effective. There are a few different options. The safest medications are sprays that are applied to the skin of the penis. These medications work by simply reducing the sensitivity of the nerves of the penis so less intense nerve signals are sent to trigger the spinal ejaculation center. There are many sprays available and they mostly use a nerve blocker like lidocaine. The goal with the sprays is not to make your penis numb—that's no fun—but to take the sensitivity down a notch.

But the skin does not absorb medication very well, so some formulas add ingredients that may improve the absorption of the lidocaine. Promescent is an FDA-approved formula that combines other ingredients that improve skin absorption. The more you spray on the penis, the more the effect. After 10 minutes you can wipe it off and you are ready to go. There is virtually no numbing effect on your partner. It's available online without a prescription (Promescent.com) but often available over the counter in pharmacies or through urology offices.

There are also prescription medications for premature ejaculation. The most commonly prescribed and probably the most effective are actually antidepressants that boost serotonin levels in the brain, known as SSRIs (selective serotonin reuptake inhibitors). It's not because guys with premature ejaculation are depressed, although it can be a depressing condition, but rather because serotonin suppresses the spinal ejaculation center. The common drugs in this class include fluoxetine (Prozac), sertraline (Zoloft), and paroxetine (Paxil). They are prescribed at low doses just to harness the side effect. They must be taken daily because they don't work very well as an "on demand" pill the way medications like Viagra do for erections. The most common side effects include drowsiness but this usually stops within 2 weeks, which is about how long they take to start working. The medication may also interact with some other medications so it's important to take it under a doctor's supervision.

The FDA considered and rejected an SSRI named dapoxetine that was more effective for single-dose treatment. Dapoxetine is approved for use in Europe. Another single-dose medication that may boost serotonin is tramadol (Ultram). Tramadol is normally used as a prescription painkiller and is not as addictive as most. It's not as effective head to head as Paxil but for many men, it's good enough and it avoids the need to take a pill daily. Side effects include nausea and drowsiness and interactions with other medications.

For some guys, none of the techniques or medications can slow down the inevitable. In these cases, there is still a work-around. If we can't help you hold back, we can still help you hold up. Normally, after an ejaculation, the erection goes down. This is because the adrenaline release that squeezes out your man juice also squeezes closed the blood vessels that pump up the penis.

This is well and good if both parties are ready to call it quits and cuddle. When you are young, you tend to be able to "reload" relatively quickly, and the next time around you may last longer. But as you get older, the reload time, known as the refractory period, gets longer and longer, and then it's too long for second chances. Prescription penis injections that contain prostaglandin can stimulate an erection so strongly that they can counteract the adrenaline rush and keep the penis pumped even after ejaculation so even when the big head is done, the little head can keep going. Pills like Viagra or Cialis, although not as strong as injections, may allow you a shorter refractory period and a second chance after all.

Are We There Yet? Delayed Ejaculation

Everyone likes a happy ending, but not everyone gets one. Many men have difficulty reaching sexual climax. It's like driving and driving but never arriving. It's more common in older men because men lose nerve sensitivity in their penis with age. Men on certain antidepressants may suffer this side effect. Hormone imbalances including low testosterone can play a role. Pornography as well as certain idiosyncratic masturbation techniques can interfere with fully enjoying partnered sex. Although this ailment is less well understood, behavioral therapy and certain medications may help.

As men get older, nerve endings gradually disappear and it can take more stimulation to get an erection as well as to reach a climax. It's important for them to understand that this is a normal change so they can reassure their partners that they are not to blame. Furthermore, many men accumulate other medical conditions that add up and take their toll.[20]

So who was it that said the golden years were golden? But you can still strike oil if you pay more attention to the remaining nerves. Sometimes more foreplay and more stimulation will get you where you need to go. Women are not the only ones who can enjoy vibrators. A vibrator applied to the head of the penis, especially the underside, in the area known as the *frenulum*, can help men with decreased sensitivity reach climax more successfully. One technique is to place a vibrator on the underside of the head of the penis for 1 minute on and 1 minute

off three times in a row, then attempt intercourse with a more "amped-up" penis.[21] There are now vibrators custom made for men that enclose the head of the penis and vibrate both the top and the underside. Kegel exercises may help a guy ejaculate with more strength and possibly more volume. Even though the ejaculation is a reflex that you don't consciously control, the better tone those muscles have, the more they may be able to spring into action.

Sad to say, but one of the most common causes of delayed ejaculation is the use of antidepressants that work by increasing serotonin levels. For some men, the treatment may seem worse than the disease, but for most men with depression, antidepressants are critical to leading a more normal life. Some antidepressants have less of this effect than others, and changing prescriptions may be the solution in some cases.

The brain chemical dopamine stimulates the spinal ejaculation center. The pituitary gland releases a small amount of prolactin to bring a natural end to an orgasm. Medications used to treat psychiatric disorders often interfere with climax and ejaculation because they can lower dopamine and boost prolactin too much. Risperidone, clozapine, and olanzapine are on the short list of culprits. Quetiapine doesn't boost prolactin as much and may have less of this side effect.[22] Rarely, a man may have a tumor in his pituitary gland that overproduces prolactin. If the tumor is big, it has to be removed surgically. Prescription medications such as bromocriptine and cabergoline can lower the prolactin level and treat smaller tumors.[23]

Most men who have difficulty reaching climax have normal levels of prolactin, and even in these cases a prescription of cabergoline can be helpful. These men may be more sensitive to prolactin so reducing even normal levels may allow them to "break through."[24] Low testosterone and low thyroid can also be hidden causes of delayed orgasm. Testosterone raises the desire level in the brain and so increases the turn-on signal to the spine. It also helps stimulate the production of semen. The thyroid gland is a "master controller" and affects overall body metabolism. If the thyroid hormones are low, the whole body can be working in slow motion. Both low testosterone and low thyroid levels can be easily corrected by supplementing them, but in many cases there still will be more to the underlying problem.

Men who have never been able to ejaculate with intercourse often are affected by some sort of psychological or behavioral barrier. For some it's an exaggerated sense of guilt or religious prohibition. It's hard to ejaculate when "God is watching." These men may not masturbate either, or may feel very conflicted during masturbation. Other affected men may masturbate in a way that is so specific and so intense in speed and pressure that an actual partner could never provide similar stimulation. I had one patient who could only ejaculate if he laid facedown on a wooden floor while thrusting rapidly. Studies find that men who masturbate very frequently are at higher risk of developing this difficulty, effectively stroking themselves into a corner. There are men, however, who simply prefer masturbation over sex with a partner. Behavioral psychologists who specialize in sexual issues are often able to help improve these situations so a guy can stop playing Solitaire and start playing Hearts.

Pornography has also played a significant role. The explosion of pornography since online streaming became available has coincided with a significant spike in erectile dysfunction and difficulty reaching climax. This is discussed in greater detail in Chapter 6. Also, the advent of pills like Viagra and Cialis has allowed men to have erections even though they may not be fully "into it." With the drug stimulating bloodflow to the penis, they can still get a rock-hard erection, but in the end there isn't enough stimulation in the big head to finish things off.

Wild but Not Wet: Climax without Ejaculation

Orgasm and ejaculation do not always come together. If the sympathetic nerves that release adrenaline are damaged from surgery or disease, a man will not be able to ejaculate, but if the sensory nerves in his skin are not damaged, he can still experience a sexual climax. On the other hand, if the nerves that provide sensation can send signals from the penis to the spinal ejaculation center but not to the brain, they can trigger a reflex ejaculation without a feeling of climax.

Diabetes and multiple sclerosis can injure the sympathetic nerves and prevent ejaculation. Surgery to remove cancer in the pelvis can too. A guy with such a problem will notice that he can

have an orgasm but no semen comes out. This may be due to "retrograde," or backward, ejaculation, where the bladder is not closing properly. It may also be due to the vas deferens, seminal vesicles, and prostate not squeezing their semen fluids. Sometimes ejaculation returns with better sugar control. Medications that boost the adrenaline signal may improve ejaculation. The over-the-counter Sudafed brand cold remedy contains pseudoephedrine, which acts like adrenaline. Taking a double dose (120 milligrams) of Sudafed a couple hours before sex may allow ejaculation. It may work better if it's taken every 8 hours for two or three doses to really amp up the system, but over time it actually loses its effect just as it does when used to treat nasal congestion. Midodrine is a prescription medication that works like Sudafed; it is most effective in men who have multiple sclerosis (MS).[25]

Other men cannot ejaculate because of surgery that removes the semen-producing structures, such as prostate cancer surgery. In either case, the man can still have an orgasm, and a normal one at that—just no wet spot. If a man has one or even both of his testicles removed, he still can have a normal orgasm and he still will ejaculate fluid from the other structures as long as his testosterone is normal or boosted to stay normal. This is true for men who have had vasectomies as well. None of these surgeries affects the sensation of the penis and all the other pleasure centers of the spine and brain that come into play.

Men who suffer injury to their spine lose sensation from their penis, as the nerves carrying the signal up the spine are interrupted by the injury. Furthermore, the eyes, ears, nose, and thoughts and fantasies in the brain cannot send stimulating signals down the spine past the injury. Even so, if the injury is above the level of the spinal ejaculation center, then an ejaculation can still happen due to a powerful reflex between the penis and the spine. The ejaculation center is in the spine just below the 10th vertebra. Any injury above this level keeps the reflex intact. The man won't feel any sensation from his penis and he won't experience an orgasm, but if his penis is stimulated enough he can have an erection and even ejaculate. The stimulation to cause an ejaculation has to be a lot stronger than what's required to cause an erection, and this usually requires the use of a specialized vibrator that vibrates much more intensely

than a regular vibrator—so strongly in fact that it would hurt a guy with normal sensation. This is used mainly for fertility purposes so that semen can be obtained for insemination (the turkey baster method). If an injury is below the spinal ejaculation center, then it cuts off the signals from the penis to the brain and once again there is no sensation and no orgasm, but it also cuts off the signal from the spine to the semen-producing structures and no ejaculation can occur no matter how much the penis is stimulated. Men with lower spine injuries can still father children by electrically stimulating the nerves to the semen-producing structures with a specialized probe that is placed in the rectum. No semen shoots out, but it does accumulate in the urethra, where it can be milked out and then used for insemination. This same technique can be used on a man who has had surgery that injured the nerves between the spine and the semen-producing structures.

Sometimes the problem is a blockage. This may be due to a cyst in the prostate that arises from birth and simply expands and squeezes shut the ejaculatory duct where sperm and other fluids all enter into the urethra to make semen. Sometimes a stone can grow right in that duct passageway and block off the fluids. A severe infection of the prostate can inflame and then scar closed the duct. The prostate fluid can still get through other ducts, so a man with an obstruction may still ejaculate a small amount. In some cases the blockage is painful, but in most cases it is not, and orgasm feels just as pleasurable. Sometimes surgery can fix these blockages, but if there is no pain, the side effects of surgery, which can include chronic infections or inflammation of the prostate or testicles, may not be worth it. A person can also be born without vas deferens or seminal vesicles. This is always the case in men with cystic fibrosis, which is due to genetic mutations that cause a chronic disease of the lungs and pancreas. Sometimes the gene mutations are less severe and only affect the vas deferens and seminal vesicle but not the lungs or pancreas.

For men who are trying to father a child but who have blockages that prevent semen or sperm from coming out, there is a work-around. Sperm can be taken directly out of the testicle with a minor procedure, and that sperm can be injected directly into eggs that are taken directly out of the woman’s ovary. The fertilized egg becomes an embryo, which is placed back in the

woman's uterus to make her pregnant. The sperm taken out of the testicle cannot be put into the woman's uterus the way semen can because the sperm won't function without all the other enzymes and proteins that are in normal semen.

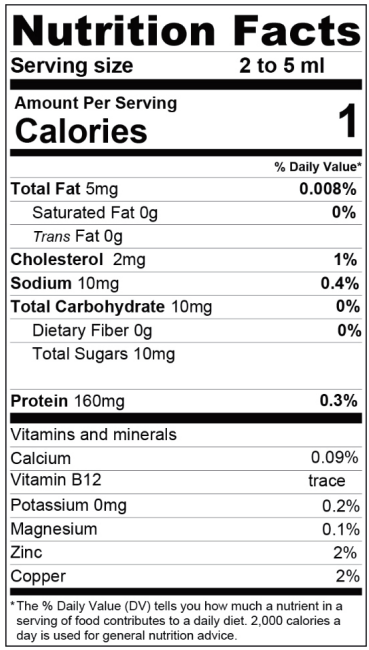
Orgasm and ejaculation are hard to beat. They can be as natural as breathing or just about impossible. Understanding the how and why and taking care of your body and mind will help you to enjoy this gift as long as you desire.

CHAPTER 3

BIG GULP: A Tasteful Review of Semen

Now for a topic you may find hard to swallow: swallowing. Or spitting. Or not. Ever since World War II, when the French introduced our boys “over there” to the previously unknown pleasures of oral sex, this has become one of France’s most popular contributions to American culture, freedom fries notwithstanding. You may find a chapter devoted to this topic lacks taste, but that’s where you are wrong, because this chapter is in fact about the taste of semen. Why does it taste like it does? (And even though you may not know what it tastes like, there’s a chance that someone you care about does.) What influences the taste? Are there any benefits or risks to swallowing it?

Let’s take a look at the ingredients in semen. There are small amounts of dozens of constituents in semen: vitamins such as B12 and C, minerals such as zinc and magnesium, proteins, carbohydrates, and a variety of other molecules including, of course, DNA. If there were a nutritional information label on the tip of your penis, it might look something like this.[1]



Nutrition Facts

Serving size	**2 to 5 ml**
Amount Per Serving	
Calories	**1**
	% Daily Value*
Total Fat 5mg	**0.008%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 2mg	**1%**
Sodium 10mg	**0.4%**
Total Carbohydrate 10mg	**0%**
Dietary Fiber 0g	**0%**
Total Sugars 10mg	
Protein 160mg	**0.3%**
Vitamins and minerals	
Calcium	0.09%
Vitamin B12	trace
Potassium 0mg	0.2%
Magnesium	0.1%
Zinc	2%
Copper	2%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Figure 1 Nutrition label for semen

Yes, it's high in protein, but so is your snot, so that's not necessarily a compelling argument to get your partner to open wide. Low calorie? Yes. Tasty? Not from what I've heard. Some of the ingredients in semen that don't actually make the nutrition label are foul tasting or foul smelling, such as ammonia-like molecules called amines. Some have names like *cadaverine* (as in *cadaver*—as in dead) and *putrescine* (as in putrid).[2]

These molecules serve important functions to protect and preserve the sperm by counteracting the acidity of the vagina. There are also enzymes that thin out the semen and then others that thicken it up, plus carbohydrates for energy and zinc and other trace elements for sperm vitality. Sperm makes up only 5 percent of the volume of semen, kind of like the amount of fruit juice in an inexpensive fruit drink. Much of the fluid is actually from the prostate (a walnut-sized gland through which the urethra runs from the bladder to the penis), and the majority of it is from the seminal vesicles (small sacs that lie on either side of the prostate underneath the bladder and dump into the urethra). All three ingredients combine in the urethra to make the sperm cocktail right at the moment of climax. A few rhythmic pumps of

the pelvic floor muscles serve up a cocktail that is freshly mixed and usually drunk right from the tap. These fluids, and their flavors, may be influenced by what a guy eats, how much he exercises and hydrates, and what kinds of medications or drugs he uses.

You won't find university-level scientific studies on the flavor of semen and whether or not pineapple really makes your man juice sweeter, but that's why we have the Internet, isn't it? What I have found is that there is a small body of evidence that fruits make semen taste a little sweeter and meats make semen taste saltier. This makes some sense since one of the ingredients in semen is fructose, and fructose is the sugar found naturally in fruit. This high-fructose man syrup is made in the seminal vesicles, the only place in the human body where fructose is made. I guess you could say that the seminal vesicle is a guy's sweet spot. From what I can gather, it may take a fair amount of juicing to flavor your juice. If you are not a fan of the pineapple, you can give kiwis a try. Kiwis have been touted to sweeten the thunder from down under. Most likely any fructose-rich fruit can, including berries—lots and lots of berries. Berries are great for your erections and your circulation in general, so why not?

Vegetables in general reportedly result in a smoother flavor than meat and dairy, which tend to make the already salty semen even saltier. Not all vegetables make for good swizzle sticks for your cocktail, however. Carrots and celery? Sure, swizzle away. But sulfur-heavy vegetables such as broccoli, cauliflower, and cabbage may be better as an after-cuddle snack. Also, heavy garlic or other spices may translate to unpleasant spunk just as you sometimes can get those odors coming through in sweat. On the other hand, cinnamon is one spice that apparently improves both the smell and taste of semen.

Working out is great for you, but stay well hydrated. Semen is 90 percent water, and the more dilute the better when it comes to the palate. Less hydration means more concentrated body fluids and more concentrated saltiness or bitterness. If you incorporate protein powders into your workout, you may look sexier, but you may taste worse. It's been reported that protein powders, like meats, make the semen saltier and may make it more lumpy and stringy—not the smooth clean and jerk you might have hoped for.

A healthy lifestyle is good *and* good tasting. Avoid cigarettes, excess alcohol, and recreational drugs. In addition to the harm these agents cause to your health, they can be a real *jizaster,* making your semen more salty or bitter. The fewer prescription meds you need, the better, since many may make your semen taste bitter.[3]

Lets face it, there's no way you can ever get your "jerkish delight" to actually taste like candy, but at least there's a product that can—sort of. There is a company, aptly named Masque, that makes flavor strips designed to be used prior to the act which have ingredients that chemically counteract the various salts, proteins, and other unpleasant flavors in semen—sort of like a fellatio Febreze. It claims that these strips not only eliminate the taste but actually leave a better one, including chocolate (yourmasque.com [inactive]). If you don't think a box of Masque would make a great stocking stuffer, then try offering your partner a stick of peppermint gum, or even some cinnamon. If you are still meeting resistance, it's probably just as well. It's possible, and some even argue probable, that we evolved to have unpalatable semen so we wouldn't eat ourselves into extinction.[4]

What if swallowing semen actually has health benefits? A study done on swallowers indicated they had a lower risk of developing a life-threatening condition called preeclampsia during pregnancy. This syndrome of sudden and extreme high blood pressure and kidney failure is thought to be due to an immune reaction by the woman against her own fetus due to the father's genes tripping off her immune system. Women who swallow their partner's semen may build up a tolerance to the same gene molecules in that semen so they may not react as badly later to carrying his baby.[5]

Dr. Gordon Gallup popularized a theory that morning sickness is also due to an immune reaction of the woman to the father's DNA in her growing baby. He suggested that more frequent exposure to the father's semen may desensitize the woman and reduce the reaction.[6] Semen also contains a variety of ingredients that can have positive effects on the body, including oxytocin, testosterone, and estrogen, hormones proven to affect mood and that rise in a woman's bloodstream after sex. A study of college women found those who used condoms during intercourse had higher rates of depression than those sleeping on a bigger wet

spot. Perhaps the hormonal absorption from the semen through the woman's vagina boosts her mood.[7]

There are no studies, but it's possible this same effect may be seen with oral exposure to the semen.

Now, it's not all good news. Oral sex has risks, just like vaginal or anal sex. Most STDs are transmitted via the semen, including gonorrhea and chlamydia—not to mention that the penis, if it is infected, can transmit human papillomavirus (HPV), syphilis, and herpes if it comes in contact with the mouth. The lining of the mouth is more delicate than the lining of the vagina, and tiny tears can allow diseases such as HIV and hepatitis to get into the bloodstream.

As with any good discussion on nutrition, I have included some recipes that are fast, easy to prepare, and delicious…well, tolerable. Okay, they actually suck, but isn't that the point?

1. **PINEAPPLE EXPRESS:** In a bowl or blender, mix 1 cup chopped fresh or canned pineapple, 1 sliced kiwifruit, and ½ cup blueberries. Stir together or blend until smooth. Consume 1 hour prior to expected pleasuring.
2. **CINNAMON TWIST:** In a small dish, mix together ¼ teaspoon ground cinnamon and ½ teaspoon sugar. Place the mixture on your tongue and allow it to dissolve enough to coat the tongue. Alternatively, suck on 1 or 2 cinnamon sticks or chew some peppermint gum. Add freshly squeezed semen. Swish and swallow!

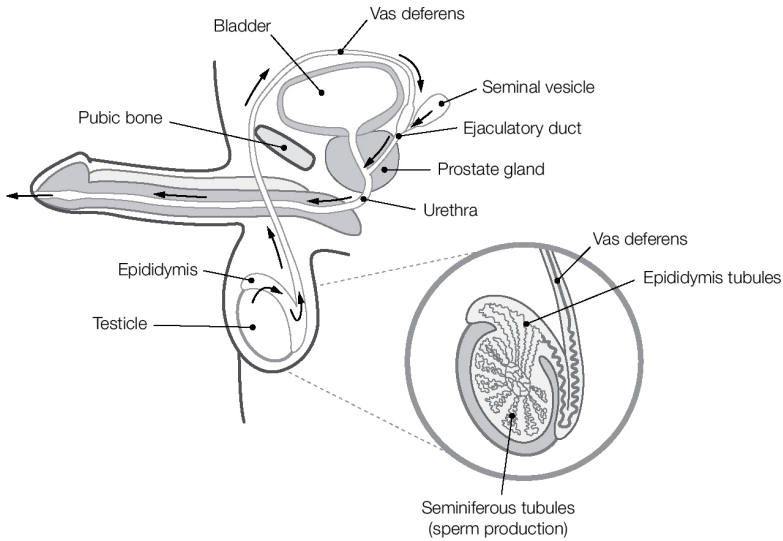


Figure 2 Where semen comes from

CHAPTER 4

SIZE MATTERS: How Do You Measure Up?

So, how does yours measure up? Probably just fine. Most men have some concerns about their size and often sell themselves short. The average size of an erect penis is not as big as most men fear, and there are slight variations by nationality.

Although there's really no need to grab the tape measure for healthy, happy sex, it's often a source of relief to understand how well you actually stack up.

Why do men have so much concern about their penis dimension (as the late, great Frank Zappa called it)? It's a natural human instinct to compare, whether you're a man or a woman. Our brains like to differentiate and rank and organize. If we can see it, we try to compare it. *This* is bigger than *that*. We compare ourselves with others. Who's taller? Who's thinner? Who has more hair? We can't help it, and every day we check our look in the mirror and then steal sidelong glances at everyone else. But there's one little problem. There's one part that we guys can see on ourselves that we can almost never see on someone else—the penis! Unless you happen to be a urologist like me, you really have a very limited understanding of the pageantry of the penis in all its various shapes and sizes. In fact, most likely you've caught some quick glances in a locker room or at a urinal or, if you are so inclined, had a more up-close and personal evaluation with a modest number of other penises, but your sample size of real-world penises is small. And if you think pornography is reflective of the real world, then you might as well think that the NBA is reflective of pickup basketball. Those guys are professionals and they have certain physical advantages that set them apart. So guys often wonder, and sometimes worry, and

occasionally obsess—and almost always for no good reason. The truth is that the vast majority of men have a penis that is normal in length, width, and shape, but they just don't have any context in which to realize it.

If you check yourself and then check another dude's dangle, yours may look shorter for the simple reason that you may have an obstructed view of your own property, thanks to your gut. There may be a hill or perhaps a mountain blocking your view, and unless you manscape, there will be some bushes. From your point of view, you probably are shorting yourself by at least an inch—and that's valuable real estate! As you get older, the pounds add up and gravity pulls the gut ever downward, like a glacier, inevitably swallowing up your mastodon.

Some men's bodies are naturally configured to hide their penis. They may deposit excess fat around the base of the penis, making the shaft appear shorter. These men aren't truly shortchanged because their erections are normally long, thick, and hard and the fat at the base yields to the force of the thrust.

Also, some men have a webbed scrotum that attaches partway up the shaft, making the remaining shaft look shorter.

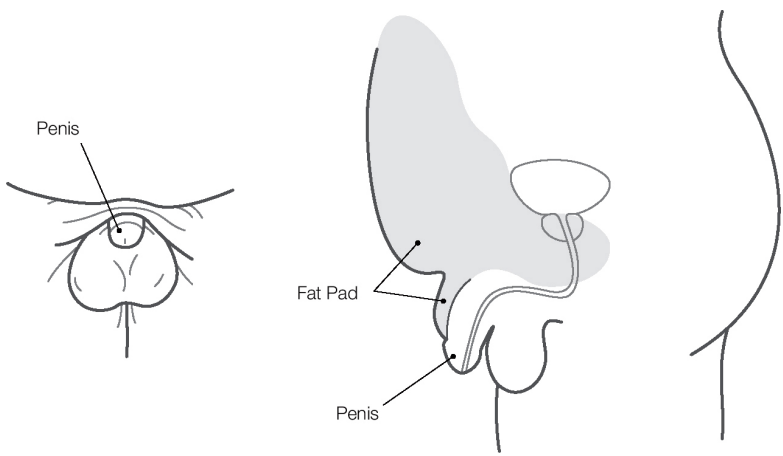


Figure 1 Hidden penis

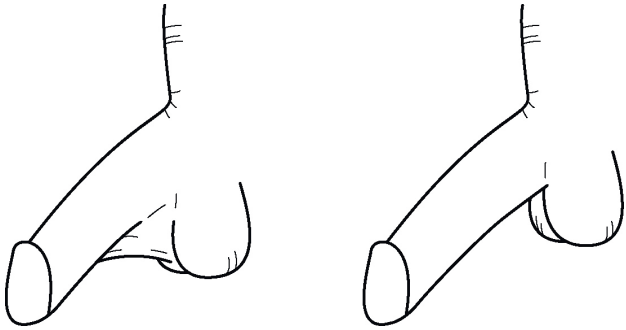


Figure 2 Webbed scrotum

It's a Small World after All

Surveys have been conducted over the years to determine normal penis size. And this quest for average has even gone international, comparing size by country. These surveys are generally the result of doctors who care about these sorts of questions, measuring whomever walks in the door—with his permission, of course. Measuring the penis is no small undertaking. It's hard to get your test subject to get it up in a sterile exam room with a white-coated, middle-aged scientist menacingly wielding a ruler. Plus it's one thing to worry if you are small, but it's another to have to actually measure up for real. So, for many studies, penis length is measured by stretching the penis while it is flaccid and measuring from the base of the penis or the pubic bone to the very tip of the head of the penis.[1] There is some variability in what this measurement means since there is more or less abdominal fat above the penis from one guy to another. The more fat, the less that's showing and the shorter the measurement. Circumference, or girth, is measured with an erect penis, usually at the midshaft.

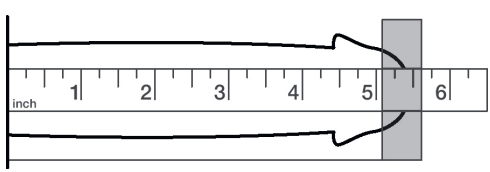
After a certain number of measurements, these doctors have stretched enough penises to claim that they have clinically meaningful results. But there are limits to what can be concluded. Height has been shown to weakly correlate with penis size in some well-done studies. Bigger men tend to be bigger, but it's not an absolute by any means. Other very weak correlations were seen with shoe size and even with the size of the pointer finger or the ratio of the size of the pointer finger to the size of the ring finger.[2, 3, 4, 5, 6]

What all this means is that to properly compare different

nationalities or races, you have to make sure that everyone in the study is the same height and weight and wears the same size shoes and gloves—sort of like doing a study on the Rockettes, except the Rockettes don't have penises. What you really have to do is have enough people from each country that the different body types of men are the same in each group, and that takes a lot more pud pulling than has been done so far. Unfortunately, some researchers have published papers promoting well-known racial stereotypes about different races and penis sizes, claiming that blacks had bigger penises than whites, who had bigger penises than Asians.[7] But when you really take a good look at the naked data, there's not a whole lot there. Many studies and Web sites that promote racial differences use unscientific means to collect their information and even ignore information that contradicts the findings they are trying to prove.

The best evaluation so far has been conducted by David Veale and his colleagues at King's College London. They did a study of all the other studies that were actually scientifically sound, and the results are in. The average size of a man's penis when soft is about 9 centimeters, give or take 1.5 centimeters when stretched. The average size when erect is a little over 13 centimeters, give or take about 2 centimeters. The average soft circumference is a little over 9 centimeters, give or take about a centimeter, and the average erect girth is about 11 centimeters, give or take about a centimeter.[8] So there you have it: the whole world in the palm of your hand.

The Internet has become a research tool of sorts, and anonymous studies of penis length have been conducted. Interestingly, when men self-report their penis sizes, the results are about 1 centimeter bigger. Give them an inch and they'll take a centimeter.[9]



The average penis size is between 5.1 and 5.6 inches.

Figure 3 Average penis size

Have You Been Downsized?

Men will often come to see doctors such as myself, concerned that their penis is too small. In the vast majority of cases, the man's penis is totally normal in size. These average guys suffer from small penis syndrome.[10] Yes, that's an actual medical term, and it's a well-known affliction. Fortunately, when these men are educated with the kind of information you are reading now, they realize they are okay and they get on with worrying about all the other little things in life. Some men aren't so easily straightened out. These men are obsessive and suffer from what is known as body dysmorphic disorder.[11] These men are really hung up on how hung they are, and it's an irrational concern. It's thought to be a similar disorder of perception as seen with anorexia, in which people always think they are too fat. And yes, there are men whose penis is smaller than average, just as there are men whose chins are smaller than average or whose ears are smaller than average or whose noses are smaller than average. The penis is considered smaller than average when it is 2 standard deviations below average. A standard deviation is a measure of how spread out everyone's measurements really are, so unless you are more than twice as different from the average size, you are still average.[12] In fact, at most about 2 percent of men have a penis that is considered smaller than normal, and these men are not necessarily coming in with a complaint. This would amount to a soft penis measuring under 6 centimeters and a stretched penis smaller than 9.5 centimeters. There is a more severe condition in which the man's penis does not grow properly from birth on, known as micro penis. Here the man's penis is 2½ standard deviations below average.[13] This is a soft penis less than 5.2 centimeters and a stretched penis less than 8.5 centimeters long. Even these men typically have satisfying, loving sexual relationships. As long as your body is healthy and functioning, there is no good reason to stress over dimensions you don't control. Yes, you can gain or lose weight, but your shoe size remains the same. Your hands don't get bigger or smaller, and your penis doesn't change either—aside from being less hidden by fat, of course. Take your natural body, keep it as healthy as you can, and enjoy it, and just as importantly, bring someone else enjoyment. That's the most important bar to measure up to.

So what accounts for the differences that do exist? We are born with a set of instructions built into every cell of our bodies that determines most of the way we turn out—eye color, hair color, and penis size. But inherited genes are not the whole story by any means. There are other things that influence how our body parts grow. Nutrition plays a role. The better our nutrition, the more those genes can do their thing since nutrition provides the building blocks that the genes utilize. Can nutrition affect penis size? The answer is potentially yes—if humans are like rats—and I know some who are. Researchers have determined that rats fed excess cholesterol have shrinkage in their penises due to effects on epigenes. Epigenes are like volume controls on the ends of the genes making them more or less pronounced. Maybe too many foot-longs will cost you an inch.[14]

But wait—there's more. The most powerful influence over the growth and development of the penis comes from hormones such as testosterone. Chapter 20, The Making and Unmaking of a Penis, explains in detail how the penis forms from the early embryo through puberty, and how imbalances in those hormones can cause the penis to be underdeveloped or to grow too much (yes, too much).

Growers versus Showers

When it comes to penis size, there's a lot less difference in the bedroom than in the locker room. This phenomenon is well characterized by the phrase "growers versus showers." With some men, what you see is mainly what you get, and with others, it's just a sneak preview. The reason for this size surprise is based in how the tissue of the penis is formed at the molecular level. The cylinders of the penis that fill up with blood are made out of a special weave of collagen and elastin. Collagen makes the penis tough and durable—like the Kevlar in body armor—and elastin is like the elastic in your underwear waistband. Woven together, this combination makes the penis stretchy but strong. Growers have *more* elastin and *less* collagen and showers have *less* elastin and *more* collagen. Growers are smaller at rest and larger at play. Growers are just as big erect as showers, proving the old adage "Don't judge a book by its cover"—that is, if it's a softcover. Growers are also more sensitive to climate change—that is,

shrinkage in the cold. Most men who are distraught with their penis size are growers and are often more concerned about how they appear in the locker room than in the bedroom. If a man is really anxious about the appearance of his penis, the anxiety itself can make it worse because anxiety releases adrenaline, which makes the blood vessels in the penis contract, shrinking the penis even more.

What a Girl Wants

Sadly, almost half of all men think they are smaller than normal when in fact they are not. Women are a bit more objective, and more than 85 percent of women size up their partners as completely normal.[15] But do women really want an 8-inch penis? No, they don't. According to studies, they actually want penises that are about average. In fact, the average vagina is 9.6 centimeters, give or take 1.5 centimeters,[16] and 2.8 to 3.6 centimeters wide.[17]

Women who were surveyed preferred girth over length when they had a preference.[18] You know what women do like to be large? The heart. That's right, most women rank personal connection over penis size as important to sexual satisfaction.

Porno Penis

Almost half of men who seek medical attention for the size of their penis admit that they feel small based on what they see in pornography.[19, 20, 21]

The average porn star is close to 8 inches when erect, but remember, studies report the average man is actually about 5.2 inches erect, with 90 percent of men measuring from 4 inches to 6.3 inches.

So what gives? Is this data just a conspiracy of poorly endowed scientists trying to justify their junk? No. The porno penis is not typical. It's an exception. But that doesn't mean that it's exceptional. Pornography is not all it's cracked up to be, so to speak. There are many pitfalls both to the viewer and the performer. Chapter 6, Sex, Lies, and Videotape: The Hard Facts about Pornography, penetrates deeply into this topic.

CHAPTER 5

BIGGER HARDER FASTER: Penis Enhancements

There's no shortage of dick-lengthening pills for sale. How much is snake oil and how much is actual snake? It turns out that there are, indeed, natural supplements that can improve bloodflow to the penis but this doesn't make it permanently bigger, just plumper for the time being. Much of what is advertised is misleading, and some is dangerous. From counterfeit ingredients to contaminants, these products are often just pulling your leg—not making it bigger. Penis pumps and traction devices abound. Understanding how they work and how they don't will keep you on the straight and narrow (but not too narrow).

The majority of us may at some time or another fall prey to a notion that we are somehow sexually insufficient. We could be bigger, be harder, last longer, reload faster. All these notions are reinforced by a seemingly endless supply of products available online and over the counter. I am approached every few days by patients who bring in "break-through" advertorials for my review. Miracle Peruvian penis-power powder, kept guarded by the Incas for centuries, does not really exist, and no longer does their $60.

There is a fascination with performance-enhancing drugs in our modern culture, and sexual performance is no exception. Part of the drive to upgrade one's penis may come from a misconception about what is actually normal. So what is reality? The average erect penis is a little under 5-½ inches. The average couple goes at it for under 6 minutes. The average volume of semen is about half a teaspoon. The average young guy can do the deed once a night, and that drops down to once a week by age 50. Of course, there are variations in either direction for all these measures. Now, if you fall outside this range of normal,

then consider an evaluation with a professional—an actual doctor. But if you are square-on normal, consider this advice: "If it ain't broke, don't fix it." Why? What could be the harm? After all, these formulas are all natural, right? Wrong. Studies have been done on various "snake oils" to see just how much "snake" there is in them. The majority of dick pills are neither all of what they claim to be nor natural. In fact, about 8 of 10 erection pills that claim to be made from "natural" formulas have pharmaceutical-grade drugs in them like Viagra or Cialis.[1] That's why some of these products can appear to work, but getting spiked supplements can be a problem. These ingredients legitimately require a prescription because they can cause side effects in some people, ranging from headache to indigestion to backache to nasal congestion. Occasionally they are associated with rare forms of hearing loss or blindness. Furthermore, if a person is taking nitroglycerine for his heart and takes a spiked supplement, he can suffer a fatal heart attack. To keep costs down and maximize profits, these ingredients are typically counterfeited. And they may be contaminated with other counterfeit prescription drugs, heavy metals, and other toxins.

Nutritional supplements are not regulated the way prescription drugs are. Instead of sterile, shiny modern facilities, these supplements can be made in old bathtubs or even cement mixers. In the end, you are often not getting what you paid for. In fact, when many over-the-counter "natural" or "herbal" products marketed for enhanced sexual performance were studied in a chemistry lab, less than 50 percent actually contained the primary ingredient they were touting, and more than half had ingredients that weren't even listed on the bottle. About a third were made just of fillers, and many had ingredients that could not be chemically identified. Less than 10 percent of brands tested used completely authentic ingredients.[2]

But not all hope is lost. After all, many medications we get from the pharmacy originated from some natural source. Several ingredients that have been studied have emerged as the more popular of the natural remedies. Many formulations combine one or more of these herbs and nutrients into complexes. This chapter reviews the more popular or studied substances. The summaries you will find here are based on scientific studies, not on what you'll find in Internet chat rooms or promotional Web site

testimonials. Although a person may post an amazing result, that does not mean it's going to happen to you or to anyone else. I have provided you information that at least has some basis. Not all scientific studies are completely without bias, however, and not all studies will prove to be reliable and reproducible. Also, before you read any further, remember, no supplement makes your penis bigger in any meaningful way. The only size boost you may get is because you are getting an erection or a semi.

GINSENG: Ginseng is touted as having benefits for boosting energy, maintaining mental sharpness, lowering inflammation, lowering blood pressure, and increasing sexual stamina. The variety that has been most studied for its effects on your root is Korean red ginseng. In limited studies, it appears to actually help men with erectile dysfunction by increasing nitric oxide (NO), which then increases bloodflow to the penis. There haven't been any long-term harmful side effects seen, and only about 3 percent of people in the studies had short-lived side effects such as stomach upset, constipation, headache, or insomnia.[3, 4]

HORNY GOAT WEED: Yes, it's really a thing. Legend has it that a goatherd noticed his goats getting more sexually aroused. Let's not go there, but somehow he "knew." This plant is found primarily in Asia but is now ornamentally grown in the West. The active ingredient is icariin, and it also increases NO much in the same way prescription penis pills do, but very little of the active ingredient gets absorbed into your bloodstream.[5] The side effects may include palpitations and mood changes, including mania.[6, 7]

YOHIMBINE: This substance was once derived from the African yohimbine tree's bark, but now it is synthesized. Yohimbine had been prescribed for many years as perhaps the only pill doctors recommended to treat erection problems until Viagra came along. It may help some men with poor erections or trouble reaching climax. It increases NO in the blood vessels and also counteracts signals from nerves in the penis that cause the blood vessels to squeeze closed. It also causes some activity in the brain that is not fully understood but may increase libido. Side effects include rapid heart rate, palpitations, high blood pressure, difficulty breathing, agitation, insomnia, sweating, nausea, flushing, headache, and mania. It may interact negatively with some blood pressure medications and some antidepressants. People with kidney problems should avoid yohimbine.[8, 9]

MACA ROOT: This is the *real* Peruvian penis-power powder, but whether it's truly powerful is controversial. The plant grows in the high plains of Peru and makes a small radish-sized root that can be cooked and eaten in a variety of ways or powdered and sold as capsules. The science is very limited, but some studies have shown a mild increase in sexual desire[10] and performance in men[11] and women[12] taking the supplement. Maca does not bump up testosterone, so the increase in libido is due to some other cause. The active ingredients include polyphenols, which are a class of plant molecules known to increase NO in the blood vessels of the penis. The side effect profile is mild but includes stomach upset, cramping, mood swings, and cravings.[13] One of the chemicals found in the root, MCTA (methyl tetrahydro-beta-carboline), is considered potentially dangerous to nerve cells if taken alone, but in combination with all the molecules in maca root, there does not appear to be any true risk.[14]

GINKGO BILOBA: The Chinese ginkgo tree is the only surviving member of its species and dates back 270 million years. The most commonly used extract has the sexy name EGb761, which is made up of plant powerhouse molecules known as flavonoids.[15] These molecules increase NO in the blood vessels of the penis. They may also trigger an increase of dopamine in the brain.[16, 17] Dopamine is a transmitter of feel-good pleasure signals and is normally released during sex. Side effects of ginkgo biloba were minimal in the few studies done, but it has been known to aggravate bleeding due to negative effects on platelets so it should not be taken within a week of a planned surgery. It also can interact with medications given for anxiety, depression, or chronic pain, and in rare cases may cause hypomania (a mild form of mania).

L-CARNITINE: This amino acid is a naturally occurring protein building block found in our diet. Studies are very limited, but it appears to boost erections. Its effect may be a combination of the good old NO boost plus other anti-inflammatory effects that may protect the health of blood vessels.[18, 19] Side effects are mild, mainly diarrhea. L-carnitine may aggravate seizures or lower the effectiveness of thyroid medications.[20]

L-ARGININE AND L-CITRULLINE: These are amino acids. L-arginine is the key molecule that gets converted into NO, which improves blood-flow to the penis. Unfortunately, L-arginine gets

blocked from being absorbed by normal bacteria in the intestine and is broken down by the liver. Very little L-arginine makes it to the penis as a result of all this molecular cock-blocking. Clinical trials demonstrate some subjective improvement but there is no "hard" evidence of increased bloodflow to the penis.[21] Side effects include vomiting, diarrhea, flushing, numbness, and arrhythmia.[22] L-citrulline is the real player. It gets absorbed in the intestine and does not get eliminated by the liver. It is actively converted to L-arginine in the kidneys. As a result, the levels of L-arginine and then subsequently of NO that reach the penis are much higher when you take L-citrulline than when you take L-arginine.[23] It turns out that if you take both, you actually get better L-arginine levels than from taking either one alone. This is probably because the L-citrulline actually blocks the molecules that break down arginine in the intestine and the liver.[24]

GINGER: Ginger has been shown to increase NO production. Side effects seem limited to indigestion in some.

Catuama: A variety of plants from the Amazon are touted to improve sexual function and energy, potentially through some mechanism that boosts NO or a molecule that then makes the NO. *Catuama* is a popular Brazilian potency blend of guarana, muira puama, catuaba, and sometimes ginger. Researchers combined a similar mix of guarana, muira puama, and ginger with L-citrulline and gave it to rats. They found the nutritional supplement blend was just as effective as prescription Cialis at boosting NO production in the penis. The NO not only improves bloodflow but it actually fights the changes that happen to blood vessels with age. Just like Cialis, the supplements actually kept the rat penises from deteriorating with age. Treatment with a combination of ginger, L-citrulline, muira puama, and *Paullinia cupana* can reverse the progression of corporal smooth muscle loss, fibrosis, and veno-occlusive dysfunction in the aging rat.[25] Toxicology studies over a several-month period found catuama caused no harm to the liver or other organs.[26]

PYCNOGENOL: This is a group of bioflavonoids found primarily in the bark of a French pine tree.[27] Its erection-boosting effects seen in human trials give new meaning to "morning wood."[28] It promotes nitrogen oxide synthase which boosts NO.[29]

QUERCETIN: This is another bioflavenoid found in such

"good" foods as green tea, red wine, and even the barrels the wine is aged in.[30] It decreases prostate inflammation, which sometimes interferes with erections.[31] In the lab, it mimics the way prescription pills boost erections,[32] and it may enhance pycnogenols effect as well.[33]

THE KITCHEN SINK: There are more blended formulas out there than you can shake a dick at. A few scientific studies of some of these brands have been performed with actual humans, and one of those is of VigRX Plus. The all-star cast of this formula includes *Panax ginseng*, *Serenoa repens*, gingko biloba, *Crataegus laevigata*, *Ptychopetalum olacoides* (muira puama), *Erythroxylum catuaba* (one of the ingredients of catuama), *Cuscuta chinensis* (dodder plant), *Epimedium sagittatum* extract (horny goat weed), *Tribulus terrestris*, *Turnera diffusa* (damiana, which has been shown to increase sexual activity and decrease anxiety in several rat studies),[34] and piperine (black pepper extract, which has been shown to increase sex drive in mice).[35] In a study, men who took VigRXPlus supplements for 3 months experienced a significant improvement in erections and sexual satisfaction compared with the placebo group, who noted very little change. This particular supplement was screened carefully and there was no evidence that it was spiked with prescription medication such as Viagra or Cialis. The only reported side effect in the study was mild fever.[36]

DHEA: This naturally occurring hormone (full name *dehydroepian-drosterone*) gets converted to several other hormones, including testosterone and estrogens. Unfortunately, studies show that it is not effective at boosting testosterone and may increase estrogen levels. Men definitely need some estrogens for good health, but as the levels get higher, estrogens stimulate more of the *bad* lipids—LDL, or low-density lipoprotein—and lower the *good* lipids—HDL, or high-density lipoprotein—resulting in hardening and narrowing of the blood vessels, which is not good for the penis (or your other body parts). Furthermore, increased levels of estrogens can cause testosterone production to power down and man boobs to sprout.[37]

Are You Pulling My Leg? Penis Pumps and Extenders

Penis Pumps

Penis pumps are the stuff of late-night infomercials and zany comedies, but they do serve a legitimate purpose. Once relegated to the back pages of pornography magazines, they evolved to the status of prescribed durable medical equipment. These devices no longer require a prescription, but they can be very effective at generating an erection for men who have difficulty getting one. The vacuum erection device (VED) is not truly a penis-enlarging device, it's a device to treat men with trouble getting erections naturally.

It works by creating a vacuum within the chamber that is placed around the penis. Blood rushes into the penis due to the vacuum. Once the penis is hard, a constriction band is deployed around the base of the penis, which keeps the blood trapped in the erect penis. Once the man has finished having sex, he can take off the constriction band, and the penis will go soft as the blood drains from the erection back into his circulation. The device can also be used without the constriction band just to fill and stretch the penis as a form of conditioning.

The vacuum device *does* make your penis erect, but it *does not* really make your penis bigger *unless* your penis has a problem.[38] A penis that has suffered poor bloodflow for a long time may develop permanent shrinkage. Poor bloodflow deprives the cells of the blood vessels and other tissues of the penis of the critical NO, as well as other key nutrients. As a result, they degenerate and turn into fibrotic tissue, which causes the penis to shrink. Eventually the blood vessels narrow and the penis can neither expand nor trap blood in itself. The pump brings bloodflow back to NO-starved tissue and stretches those blood vessels that have become stiff and narrow. This has been helpful for men who have undergone prostate removal surgery and have erection problems after surgery.

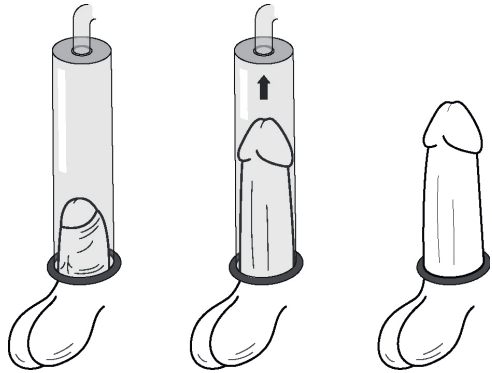


Figure 1 Vacuum erection device

Penis Traction

If someone tells you he can make your penis bigger without surgery, he is pulling your leg. And if he is pulling your third leg, then he might be right. There are a slew of pud pullers available. Going by the name of "penis extenders" or "penis traction devices," they are almost all copycats of the same device, with minor tweaks.

The device is fairly medieval in appearance. It is positioned at the base of the penis, and the extension arms on either side attach to a platform with a tension band or "snuggie" that cinches down around the end of the penis shaft, just behind the head. The device is meant to be used with the penis soft, not erect. The extension arms are springloaded and can be lengthened with additional sections. The goal is to set the length of the extension arms such that the penis is pulled as taught as possible without causing actual pain. It's like putting your penis on the rack, but not actually torturing it. The stretching causes some microscopic breaks in the penis tissue while stimulating new cell growth in that same tissue. Eventually the microbreaks fill in with new cells and the penis shaft gets a little bigger. The device is put on for 2 hours, then removed for 20 minutes to give the little guy a break, and then replaced for 2 more hours. More time is even better, again with a 20-minute break. For active working people who don't wear kilts, this can be inconvenient. But it *does* work, if only a little. Now sometimes a little is all you need, but keep in mind the majority of patients seeking to lengthen their penis

already are normal. In the largest study conducted on men with normal-size penises who used penile extenders 4 hours a day or more for 6 months, the increase in length ranged from 1 to 2 centimeters both for the flaccid length and for the erect length. (Some were showers and some were growers.) There was no real increase in girth.[39] The gains are actually more substantial when the penis is abnormally shortened, as with Peyronie's disease. In this situation abnormal scar tissue forms along the shaft of the penis, preventing it from expanding normally, which results in a curvature of the erection as well as shortening and narrowing at that spot. Penile extenders can improve length and decrease curvature, but taking a perfectly normal penis and turning it into a monster cock is not going to happen.

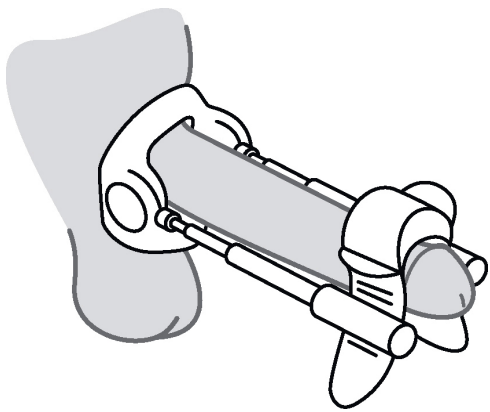


Figure 2 Penis traction device

Jelqing

Jelqing is a recently popularized technique making its way around the Internet. Instead of using a device, you take matters into your own hands. The technique is performed by tightly encircling the shaft of the penis with thumb and finger in the "OK" sign and milking the penis from base to tip firmly and slowly to squeeze blood forward and stretch out the tissues and vessels.[40] Given the rather mild enlargement that comes with 4 or more hours of continuous traction with a penis extender device, its not surprising that jelqing does more to enlarge your forearms than your penis.

There does exist another type of penis enlargement, which is the equivalent to stuffing a bra. It is an extension piece worn over the penis, a semirigid sleeve made out of plastic or latex. It's like a condom on steroids, and it can add 3 inches, depending on how you size it. It also adds girth. The sensitivity loss is substantial, given that you are wearing the equivalent of a toilet paper roll around your rod. These items have not been studied in clinical trials, which is probably not a major loss to the scientific record.

Penis Enlargement Surgery

Breast augmentation surgery has become commonplace. Celebrities talk freely about theirs and most of us know someone who has undergone this surgery. It's not unreasonable that guys think, hey, what about augmenting my sex appeal? The issue is that the penis cannot be enlarged the way the breast can. The breast is soft and can stretch around an implant that is bigger than itself. The penis, on the other hand, is made of tissue that can only stretch as far as it does during an erection—no farther.

Penis-lengthening surgery actually relies on an optical illusion. The penis is merely dropped downward a little by cutting it free from a ligament that holds the base of it just under the pubic bone. Once this suspensory ligament is cut, the penis hangs lower and so the flaccid penis looks longer, but as with nonsurgical techniques, only 1 to 2 centimeters longer. And when erect, it will be close to its original size but maybe a bit wobbly or even pointing downward without that ligament stabilizing it.

One of the more common complications of the surgery is penile shortening because the tissues where the tendon was cut scar and shrink, sucking the penis back up into its original position and effectively "short"-circuiting the whole procedure. Other complications include irregular, dog-eared incision edges and unsightly shifting of the scrotal skin onto the penis shaft. Patient satisfaction is below 30 percent, and many require reoperation to fix complications.[41]

Penis girth is a different issue. Instead of making the penis longer, the procedure adds a layer around the shaft to increase girth. This has been done with a variety of materials, from liposuctioned fat to tendons to silicon sleeves. Although these procedures have resulted in increased girth, over time there is a

significant rate of contracting and scarring of the tissues under the skin, leading to lumpy, bumpy, and overall deformed-looking penises. Bigger isn't better if it's bizarre. Dermal fillers such as those employed to treat wrinkles have also been used, with low complication rates.[42] In the United States the Girthmax technique is a stepwise approach to sculpt the penis more gradually with less injected. High patient satisfaction rates are reported.

Long term durability is still to be determined as the fillers may gradually dissolve over time. There is not much out there for increasing the size of the head of the penis, so if the penis is not sculpted properly, you can end up with a Zippy the Pinhead look.

Remember, *most men who tried these devices and techniques and surgeries had normal-sized penises to start with.* Many men simply overestimate what normal is. Studies report up to 90 percent of men who initially came in to their doctor for treatment declined once they were simply educated about how normal they were.[43] Perhaps just as important, the perception of their sexual partners, usually women, was that they were normal as well.[44] For some men, judiciously performed penile enhancement can facilitate a happy and healthy sex life, but beware not to be lured into a false sense of insecurity. If it truly ain't broke, don't fix it.

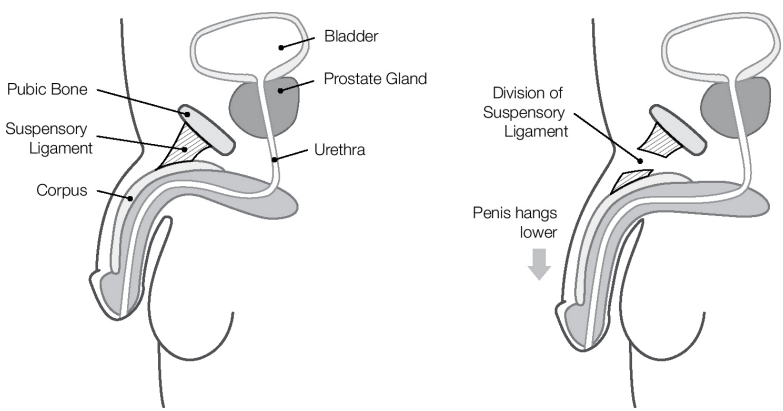


Figure 3 Penile augmentation surgery

Bling for Your Thing

Okay, maybe you don't want to try to make it bigger with surgery or injections, but you feel the urge to dress it up a bit. Penis

sheaths, wraps, and piercings date back millenia. Mention is made of piercings in the ancient and classic sex manual the Kama Sutra. Darwin theorized that humans made themselves more ornamental to increase their chances of attracting a mate and reproducing. Ancient civilizations and more recent cultures in Africa, Polynesia, aboriginal Australia, and southeast Asia practice piercings and "modifications" or mutilations. These practices are fairly radical by Western standards and include passing a bone or rod through and through the head of the penis and often the urethra. This practice is known as *palang* in Borneo. The claim is that the palang provides more stimulation to the vagina. Personally, I'll stick to the French tickler. Another practice, subincision, involves flaying the urethra from stem to stern and is practiced in aboriginal Australia.

Flaying the urethra apparently gives an appearance of a wider penis. Clearly in the Outback there's not a lot of writing one's name in the snow. Some scholars believe this flaying of the urethra is done to mimic the twin shafts of the kangaroo penis. It seems the kangaroo is revered for its sexual stamina, mating for up to 2 hours at a stretch.

The point of these genital alterations is to attract and please a mate, but perhaps also to establish dominance amongst other men. Stateside, we tend to do that with a Ferrari.

Another practice among several cultures in southeast Asia is the placement of inserts of various sizes and shapes under the skin of the shaft of the penis, known as *kandoekoe*, which translates to "bumpy." Some women reportedly require a minimum amount of these inserts to consider a suitor for marriage. I have encountered such men whose implants became inflamed, causing a severe reaction in the fatty tissue and skin surrounding the objects. This resulted in a severely and permanently deformed penis—not so sexy.

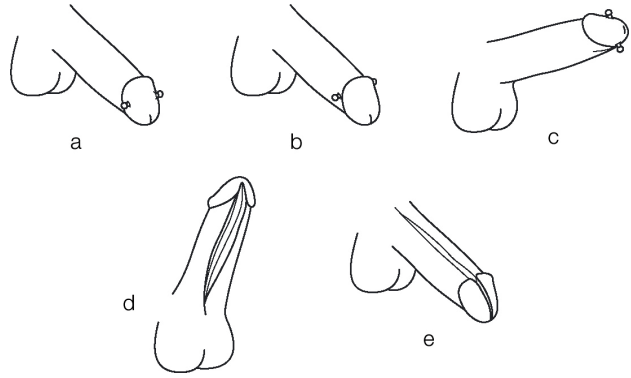
On the more delicate side, nobles in 8th and 9th century Japan practiced *tsutsumi,* in which, on their wedding night, the husband would present his penis, wrapped in silks and ribbons, to his blushing bride. Over time, silks and ribbons were replaced with origami animals or mythical creatures in a ritual known as *kokigami*.[45] In the modern era, you can surprise your lover with a phallic photo shoot from Dicture.com, through which Soraya Doolbaz, "professional penis photographer," will dress up the

dong and give it a little penis paparazzo treatment.[46] Consider such a portrait well hung on any wall you choose.

For a long time, genital piercings were considered the domain of the "modern primitive," but since the 1990s their popularity has been on the rise, and so have the penises they adorn. Figure 7 summarizes the most common piercings. Approximately 2 to 3 percent of Americans sport genital piercings[47] and almost 30 percent have other piercings.[48]

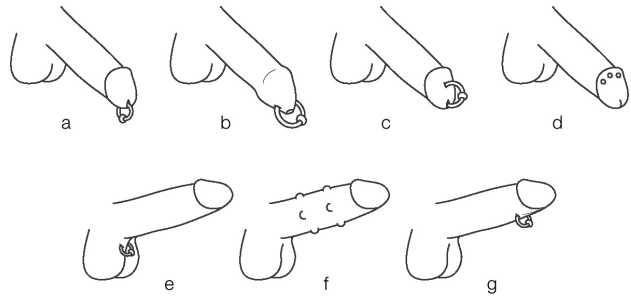
Men and women report experiencing heightened sexual stimulation while wearing genital piercings or during sex with a partner who is pierced, but there are also possible complications. Piercings are not performed in a doctor's office but rather in a piercing/tattoo studio or even self-inflicted. Complications such as infections or bleeding from the piercing can occur. In severe cases, a flesh-eating bacteria can take hold and destroy the skin of the penis, scrotum, and even the abdomen, which can be fatal. There may be a greater chance of contracting STDs due to the break in the tissues. In rare cases, repeated inflammation of the penis at the site of the piercing has been shown to result in cancer of the penis at the opening.[49] It is also possible that the chromium, nickel, and cobalt typically found in steel may stimulate cancer.[50] A poorly placed piercing may result in severe bleeding if the spongy tissue of the penis that fills with blood is injured. In rare cases, even erectile dysfunction can occur, leaving you with too much dangle in the jingle jangle. The bar or ring of a piercing can eventually erode and damage or disfigure the flesh of the penis, as well as the urethra. This may alter the urinary stream, causing spraying. Finally, partners may incur injury from the metal components during intercourse or oral sex.[51]

To each his own, but you only get one penis in this life and it's got a lot more going on than an earlobe, so whatever you do, treat it with respect. Even more important, if you do end up gilding the lily, don't try it at home. Only go to a licensed facility, and never be afraid to see the doctor, especially if something doesn't look quite right.



a. Palang b. Talede c. Vertical Palang (Apadravya) d. Subincision e. Superincision

Figure 4 Aboriginal genital alterations



a. Prince Albert b. foreskin c. Cleopatra d. dydoe e. hafada f. kandoekoe g. frenum

Figure 5 Modern genital piercings

CHAPTER 6

SEX, LIES, AND VIDEOTAPE: The Hard Facts about Pornography

Porno penises are bigger than life. The average erect male penis is between 5 and 6 inches. The average male penis does not make porn. Most men who don't look at penises all day (like I do) can feel inadequate when they see a porn penis, but there's a reason it's a porn penis. It's entertainment. Spectators don't like to watch average athletes who are of average height and average strength making average plays. Same with porn. But is professional sex actually better? Being a porn star "comes" with its problems, and so does watching porn. This chapter goes behind the scenes of the male porn star's world. It also uncovers the psychological implications of viewing porn. Porn may be used to spice up a relationship and break through taboos, but it can also become an addiction and desensitize a man, undermining his ability to relate to a real person.

Porn Stars

It's a dirty job, but somebody's got to do it. So what would it be like to be a porn star? This is a question that has crossed many (I daresay most) men's minds, if only for a fleeting moment. Perhaps you fancy yourself an amateur porn star, or perhaps, given the subject matter of this book, you *are*, in fact, an actual porn star. But if you are like most men, you have simply gazed with wonder and almost certainly intimidation at the action on the screen, wishing you had a third hand to hold your smartphone.

Interviews with porn stars reveal that being "hard" at work is indeed hard work. The average 20-minute clip can take about 4

to 8 hours to film. This entire time, the male porn star must be able to have an erection on demand—and keep it for hours—and this is with a camera crew, lights, and onlookers. Compare that to the 2 to 8 minutes of intimacy for the average couple.[1] The male porn star has to come on demand—no faking—and with the power and accuracy of a sniper. No drizzling for the big screen. Full facial glazing has become an industry standard. His costar may not be someone he finds sexually appealing, may be irritable or sick, or may be strung out on drugs. Sometimes the male porn star just isn't up to the task and can literally take hours to finish, until finally a stunt double may be called in—or a pump bottle of lotion in a pinch.[2] And it's not all satin sheets and candlelight either. It gets cold out by the pool. The floor is murder on the knees, and those shower scenes require the balance and strength of a gymnast—a gymnast with a perpetual erection, that is. Every 28 days he has to submit to STD testing,[3] but that's not really going to cover him, because these performers often have numerous liaisons offscreen with people who aren't porn stars and aren't getting tested. The average male porn star has had sex with almost 150 partners,[4] compared to about 6 for us civilians.[5] The female porn stars have had sex with, on average, 75 partners. In Los Angeles, where 70 percent of America's porn is created, condoms are used only 17 percent of the time in heterosexual porn.[6] Gay porn has made a much stronger commitment to condom use both for the performer's benefit as well as to set an example for viewers.[7] But this is eroding with the increase in amateur gay porn now available online, as well as an increased false sense of security because treatments are now available for HIV.[8] The Los Angeles health department has reported thousands of cases of STDs, including HIV, among the porn stars who have submitted themselves for testing.[9]

Sex may sell, but male porn stars don't necessarily cash in. The average male porn actor makes a few hundred dollars, sometimes more, per movie—no royalties—and is kicked to the curb after a very brief career. They often start as actors who hit the skids. Once you're in porn, there's really no going back to the mainstream acting world. In gay porn, it can pay to suck, but the pay sucks worse than in straight porn. Gay porn producers have an insatiable appetite for fresh new faces because they are giving their audience a voyeuristic fantasy. Consumers don't want to see

a familiar face—they can get that at home, after all. In straight porn, the male performer has a longer career since the screen shot typically crops out the man's face, focusing more on his equipment and the woman's face. Male porn stars may eventually perform in both gay and straight porn. In gay porn, straight men will often stay on "top," but versatility lends to greater longevity. On or off the menu of services are kissing, rimming, topping, bottoming, and ejaculating while bottoming (particularly valuable). It's basically about keeping the work "coming." Most gay male porn stars have to supplement with stripping and escorting.[10] So why do it? Do they like their work after all? The answer is a definite maybe. Porn star satisfaction surveys indicate that they are as happy and well adjusted as the average Joe, but there is skepticism about these answers in that a porn star's definition of self-esteem and happiness may be unhealthy and unsustainable at its core. For example, having his self-confidence based on sexual stamina and conquest may drive the male porn star to perpetuate that personality both on and off the screen, perhaps ultimately to the exclusion of a satisfying long-term relationship.[11] Anecdotal mea culpas of ex–porn stars fill the Internet, with their tales of woe and regret often centering on the theme of losing touch with the ability to love.

Spectators

What about the spectators? With the advent of the Internet, pornography has become ubiquitous. Pornography and the Internet have been strange bedfellows from day one. Back last century, in the days of dial-up Internet (for you young'uns, dial-up is the online equivalent of two cans and a string), one of the most popular downloads was ASCII porn—erotic images made only of various keyboard symbols, cleverly arranged line by line. Back then, that's about the best you could do—think texting porn with no photos and no eggplant emojis (8===>, get it?). Our sexual appetite for more than just asterisks and exclamation points drove the ever-widening bandwidth we all enjoy today. Downloadable pictures progressed to downloadable videos, which progressed to on-demand streaming, which is now 3D virtual reality. There are even haptic-touch feedback-powered porno peripheral plugins to plug into.

You can thank porn for online credit card transactions, the concept of free content with upgrades to a premium service, and perhaps e-commerce itself. Pornography is likely what made the Internet what it is today.[12] You could say that, because of porn, the Internet became ubiquitous. Sex sells—and how. Globally, pornography is a $97 billion industry, with about $12 billion coming out of the United States.[13] So if you feel that you have been overexposed to pornography, it's not by chance. Pornography has been thrusting itself at your face for years, and it quite literally tries to hit you in the eyes with the money shot any chance it gets. By 2020, it is estimated, more than 190 billion pornographic videos will have been watched and the average viewer will have watched more than 500 on his cell phone that year alone.[14] I'm not sure how many gallons of hand lotion that involves, but it means it's important for you to keep a firm grip—on reality. Pornography is a premise that is seductive but can be destructive if you don't have the proper perspective—and I don't mean POV or first-person shooter.

So, is pornography addictive? Well, it certainly has a lot of the characteristics of an addictive substance, but whether viewing porn is a true addiction is controversial. Yes, so-called "porn addicts" seem to watch more and more and need harder- and harder-core action and seem to feel less excitement—sounds like a drug, right? On the other hand, if they stop watching porn, there is no actual physical withdrawal—unlike with a drug. So in that regard, perhaps it's more like eating chocolate—you may have a hard time controlling yourself, but if you can't get it, you don't actually get ill. On the other hand (that's that third hand I was talking about), pornography can cause real harm to relationships and to an individual's sense of self-esteem and ability to relate to others, and that makes it more like a drug than like chocolate.

As pornography has become increasingly available, it has become increasingly available to children. It's jaw-dropping what those birds and bees are doing now. So many adolescent boys and young men (and some young women) have the depictions of pornographic sex burned into their brains. This is how they "learn" sex. But Internet porn is not meant to be educational, it's meant to be entertaining and a fantasy. If porn reflected real life, it wouldn't be a multibillion-dollar industry. Twenty minutes of

Olympic-level sex is the result of many hours of filming, makeup, prescription drugs, enemas, soft-tissue injuries, and tedium. But your brain doesn't like to make such distinctions, and so porn sets an unrealistic expectation for the viewer, as well as his partner. Everything is extreme, from the size of the penises to the size of the breasts. The duration of thrusting, the Cirque du Soleil positions, the exotic but extremely uncomfortable locations, and yes the high-volume/high-velocity money shots—all are extremes, and that's just straight-up "normal" porn. It gets a lot harder and a lot stranger the deeper you dive. Learning sex from porn is like learning how to drive a car by watching *The Fast and the Furious*—you will eventually crash.

My colleague Stephanie Buehler, who has literally written the book on sexual behavioral medicine (*What Every Mental Health Professional Needs to Know about Sex*), has sadly gained a whole new group of patients since the massive uptick in Internet porn consumption. These are women, typically in their thirties, who have been rejected by their partners because they don't respond sexually the way the female porn stars do in the videos. The guys are convinced they are doing everything correctly because, after all, they learned it from the videos and they studied the "plays" over and over. The woman must have a problem since she isn't having vaginal orgasms like *all* the women in porn. Turns out 20 percent of women do not have vaginal orgasms, and that's just a natural variation. About half of these women do have orgasms, but with clitoral stimulation other than vaginal penetration. These women are normal, healthy, and capable of intimate, satisfying relationships, but they have been labeled defective by guys who, unfortunately, think Internet porn is some kind of online sex school.

A milder version of this syndrome arises when men in relationships get an appetite for new kinds of sex they see in porn, but they are afraid to mention it to their partner for fear of seeming deviant or "gross." When asked, most of these men's partners would be happy to discuss it, although middle-aged women would be a lot less inclined to accommodate these requests than younger women in younger couples who themselves have also been watching porn. In these younger couples, the women may interpret that more exotic sexual acts are a normal requirement for their partner's satisfaction and so be

more enthusiastic. However, some couples who watch porn together do so mainly while they are under the influence of alcohol or drugs, and one of the two doesn't really like what they are watching and what is stimulating the other, but buries it with the drugs or alcohol. Eventually that resentment surfaces and can hurt the relationship "unexpectedly."[15]

We know we can't play basketball like LeBron James, but watching him doesn't make us feel inadequate because we *know* he is exceptional. One of the reasons we know this is because we have seen mere mortals play basketball. In fact, most of us have even played basketball with other average people. We know what an average layup, jump shot, and (rare) dunk looks like. But most of us haven't been up close and personal with other *average* people having sex. Watching porn can lead to an unrealistic and unfounded disappointment with our own very normal equipment. Almost a third of men who watch porn think they got shortchanged, and they are twice as likely to think they are running around half-cocked compared with men who don't partake.[16] In fact, about 40 percent of men who come to urologists' offices seeking penis enlargement surgery got the idea that their weenie was teenie from watching porn.[17, 18, 19]

Not only is the normal penis getting cut short by porn, it's getting deflated as well. Since the advent of Internet streaming "porn tube" sites, there has been a dramatic spike in the percentage of young, healthy guys who can't get it up. Before the current tsunami of streaming sex, only about 5 percent of men under 40 had this problem; now, up to 1 in 3 guys peters out. To make matters worse, desire for sex has plummeted. And more and more guys are left high and dry—unable to reach a climax and ejaculate. Don't it make your brown balls blue?[20] Even teenagers are suffering from erectile dysfunction. When I was a lad, boners were as natural for teenage boys as pimples and greasy hair. Sadly, this is not the case for many high school seniors who like to sneak a peek at porn, with up to 25 percent reporting difficulty getting erections.[21] As of 2014, over half of college-aged men reported being exposed to Internet porn prior to age 13, more than triple the amount just 6 years earlier.[22] Men who suffer from compulsive sexual disorder reported they started watching porn around age 14, whereas unaffected men reported first watching at around age 17.[23]

Regular viewers of porn are at greater risk of losing interest in sex with a real, live partner. And even if you were content to retreat to the holodeck and just have cybersex, the porn itself becomes less stimulating over time. Guys who watch a lot of porn have a hard time getting hard, even when watching really hard-core stuff. The stimulation that pornography provides is especially powerful because it revs up a drive that is primal and that we are already programmed with. It's like pouring gasoline on a fire.[24] There is a brain center that drives the desire to see something new or different when watching porn. It's called the dorsal anterior cingulate cortex, or DACC. This center will drive the frequent porn user to keep seeking more and more novel images, but all the while it becomes less and less responsive, and so he needs to feed it even more.[25] The guy will have to up the ante. Half of men surveyed reported venturing into explicit territory they may have never previously found appealing or even stuff they may have found to be disturbing.[26] Dr. Stephanie Buehler, the prominent sexual medicine specialist I mentioned earlier, shared with me that she is seeing a new trend in which young straight men show up in her office confused and scared because they are inexplicably attracted to transgender pornography and convinced that they must be gay, even though they don't identify as gay in any other way. She carefully evaluates them and finds that, indeed, they are straight, but their adventure into pornography has revealed erotic images they weren't expecting and, given their limited experience with real partners, they don't have the perspective they need to understand their own reactions to what they are seeing. Many will go so far as to arrange an intentional sexual encounter with a transgender person but usually back away from the rendezvous at the last moment as the Internet fantasy comes bumping up against reality.

But there is hope. Turned-off men who turn off the porn eventually can be turned on again—by a real partner.[27] What about guys who *do* have partners—as in married guys? A 10-year study of marriages showed that the more porn the husband watched, the greater the chance of problems in the marriage. Marriage satisfaction steadily declined as the husband increased his viewing from occasional to a few times a month to a few times a week. Marriage satisfaction then took a sharp nosedive

when the husband viewed porn daily.[28]

Ironically, many married men who watch porn do so to keep sexually aroused with their partner.[29] Sexual arousal is associated with a surge of dopamine in the man's brain. Dopamine is the main brain chemical associated with pleasure, and dopamine surges are seen with other addictive activities as well.[30] Sexual reproduction is a basic requirement for our survival, just as food and water are, so it only makes sense that our brains are geared to want the very things our survival depends on. The critical difference is that the reward centers of our brain that respond to sexual images are the same centers that respond to addictive drugs like meth and cocaine. This is not true for food and water and other natural rewards.[31, 32, 33] The more the addictive centers are stimulated, the stronger the desire becomes, and this can lead to impulsive Internet usage, if not actual sexual behavior.[34] Interestingly, it's not the actual watching of the sex itself that boosts dopamine; rather, it's the anticipation of what the person is about to see. The same phenomenon can be seen with gamblers whose thrill is not so much the playing of the game, but rather the anticipation.

With frequent viewing, a guy can develop a disconnect between what it takes to "turn on"—to satisfy the wanting—and what he actually likes or loves. So in order to actually get an erection, he's got to watch harder- and harder-core porn, but it's not really what he likes and so he has trouble keeping his erection in good old partnered sex with a real person—even though he genuinely would like to have sex that way and may genuinely care for that person.[35] Sadly for very affected individuals, not only is sex impacted by a porn addiction, but the part of the brain that lets us enjoy all sorts of everyday stuff gets blunted too. This part of the brain, called the prefrontal cortex, also gets blunted with drug addiction, making it hard for addicts to ever feel "normal."[36] It's like eating something sugary sweet right before you bite into a piece of fruit—it makes the fruit taste bland. Turning to porn before your sweetie can make her or him seem blander too. One study demonstrated that the more porn men watched, the less satisfaction they had with their partners in terms of affection, physical appearance, sexual curiosity, and sexual performance.[37]

So how much is too much? In one study of men with

compulsive sexual behaviors, these men were glued to the screen for 20 hours a week versus “normal” guys, who watched about a half hour of porn a week.[38] It’s estimated that 3 percent to 6 percent of men are classifiable as “sex addicts”—addicted not just to porn but to strip clubs or sex with sex workers or other consenting adults.[39] Many years of compulsive viewing of porn can actually shrink parts of the brain that are important for romantic love—and for keeping erections. These include the right caudate of the striatum.[40, 41] The putamen, another deeper brain structure that sends the signals to actually make you hard, powers down with more and more porn.[42] Notably, gay men watch more Internet porn than straight men.[43]

The depictions of sex—the positions, duration, orifices, fluids, additional partners, and various combinations thereof—set a standard in the minds of the guys who are watching with any regularity. Aside from the fact that these depictions were neither done in real time nor candid, and aside from the fact that they are the result of unusual and often grueling video recording sessions, it’s also important to understand that the vast majority of women are not even watching this stuff[44] and don’t realize what these guys expect from themselves and from them. But the producers of porn *do* know how to push the right buttons. In fact, scientific studies of eye motion tracking reveal that the two most eyeball-grabbing aspects of straight porn are first, the woman’s face, and second, the erect penis. Put the two together and that’s why the money shot—ejaculating on the woman’s face—*is* the money shot.[45]

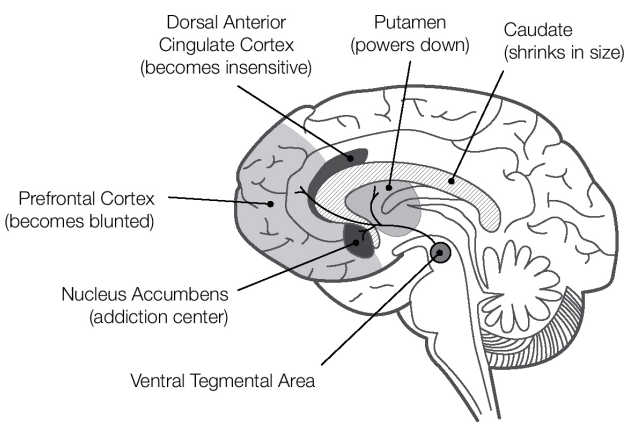


Figure 1 Porn on the brain: effects of excess viewing on brain centers

CHAPTER 7

SHORTCUTS: All about Circumcision

Male circumcision—the surgical removal of the foreskin of the penis—is one of the most common surgical procedures performed globally. One in three males undergoes this procedure worldwide. The foreskin develops during the third month of pregnancy when a fold of skin pops out from under the head of the penis (glans), like a collar, and then slowly grows until it covers the head. It's on there pretty tight right at birth, and it's not until about age 5 that it can be partially rolled back without discomfort. By 17, most teenage boys can pull the foreskin back easily.

Circumcision is one of the oldest surgical operations known to have been performed. Some experts think it started in the region of Egypt more than 15,000 years ago. The earliest mummies, dating to 1300 BC, were found to be circumcised, and Egyptian wall paintings depict circumcision many thousands of years earlier.[1] There is even some evidence aboriginals required it as a rite of passage for becoming a man before 10,000 BC.[2]

In Judaism, the Covenant of Circumcision includes a religious circumcision ceremony called a brit milah, or bris. The ceremony is performed by a mohel ("circumciser") on the 8th day of a male infant's life, as described in the 17th chapter of the book of Genesis.

> Then God said to Abraham, "As for you, you must keep my covenant, you and your descendants after you for the generations to come. (Gen. 17:9) This is my covenant with you and your descendants after you, the covenant you are to keep: Every male among you shall be circumcised. (Gen. 17:10) Any uncircumcised male,

> who has not been circumcised in the flesh, will be cut off from his people; he has broken my covenant." (Gen. 17:14)

Later in the Book of Genesis, circumcision is used as a military tactic. According to the text, Shechem the Hivite prince had "relations" with the patriarch Jacob's daughter Dinah in a dishonorable way. Now, he was not a Jew but he really wanted to make an "honest woman" of her. Dinah's brothers were infuriated and they hatched a plot.

> They said to them, "We can't do such a thing; we can't give our sister to a man who is not circumcised. That would be a disgrace to us. We will enter into an agreement with you on one condition: that you become like us by circumcising all your males. Then we will give you our daughters and take your daughters for ourselves. We'll settle among you and become one people with you." (Gen. 34:14–17)

Prince Shechem agreed and they all got cut on the same day. Talk about taking one for the team! Well, 3 days later, as all of the men in the kingdom were recovering from their surgical procedures, Dinah's brothers attacked them while they were in their delicate state.

> Three days later, while all of them were still in pain, two of Jacob's sons, Simeon and Levi, Dinah's brothers, took their swords and attacked the unsuspecting city, killing every male. They put Hamor and his son Shechem to the sword and took Dinah from Shechem's house and left. The sons of Jacob came upon the dead bodies and looted the city where their sister had been defiled. (Gen. 34: 25–28)

In Islam, the act of circumcision is one of the rules of cleanliness pertaining to the "fitrah." *Fitrah* is an Arabic term used to represent the innate disposition and natural character and instinct of the human creation. In the Qur'an, the Prophet Muhammad is reported to have said:

> Five are the acts quite akin to fitrah: Circumcision, shaving the pubic hair, cutting the nails, plucking the hair under the armpits and clipping (or shaving) the moustache. (Qur'an Sahih Bukhari 7:779)

Islamic circumcision can be performed at any age but it is often performed during the teen years as a rite of passage. Circumcision in certain southeast Asian countries is also performed as a rite of passage or coming of age. In some cases, such as in Timor, several boys at once may undergo circumcision as a group activity, using fairly primitive techniques.[3]

With the rise of Christianity, circumcision was typically discouraged and there was some pushback against it, as well as in the Reform movement of Judaism.[4]

It wasn't until 1865 (in England) and 1870 (in the United States) that circumcision also became a medical practice. There wasn't a lot of science behind it at first; it mostly served as a way to discourage masturbation.[5] Nowadays there are several reasons why millions of circumcisions are carried out, some religious, some cultural, some medical, and some just personal.

According to the World Health Organization, about 1 in 3 males worldwide is circumcised. It has become the norm for most boys born in Canada, Israel, Australia, central Asia, Bangladesh, Pakistan, Turkey, Indonesia, the Philippines, the Republic of Korea, and also much of the Middle East.[6, 7] Americans are big tippers, but it varies by ethnicity. Caucasians get cut (91 percent) more than African Americans (76 percent) who get cut more than Hispanics (44 percent).[8, 9]

The Brits don't like to mash their bangers. Circumcision rates are opposite those in the United States: Only 16 percent of British men in their forties report their wankers being whacked, and the rates get lower with younger generations.[10]

Turtlenecks are the style in Latin America, most of Asia, and Europe, where circumcision is rare. Africans, on the other hand, are increasingly going for V-necks; in Africa, studies have shown that circumcision lowers the risk of contracting HIV because the delicate foreskin is more susceptible to the virus than the rest of the penis.

The Circumcision Procedure

NEWBORN CIRCUMCISION: Circumcision of a newborn is a fast, safe procedure when performed by a skilled practitioner. To lessen pain for newborns, a mild analgesic may be used after the procedure. Some health care practitioners also use a sweetened pacifier. A jewish mohel may give a few drops of sweet kosher wine. The penis can be numbed with local anesthesia such as EMLA cream or a small injection. Circumcision is usually done within 10 days of birth. There is some evidence that babies may be less likely to feel pain 7 to 10 days after birth because newborns have a high level of endorphins (substances made by the body that reduce pain). With prep time, a modern circumcision for an infant male today takes about 10 minutes to complete. Approximately 70 percent of obstetricians, 60 percent of family practitioners, and 35 percent of pediatricians practice newborn circumcision.[11]

There are several ways to perform a circumcision. The most common technique uses a tool called the Gomco clamp. With this device, a little safety helmet is put on the head of the penis, separating it from the foreskin, and a platform is put below it that pinches the skin while it is trimmed away. The cut typically heals in 5 to 7 days. The Plastibell device utilizes a plastic safety helmet and has a groove at its bottom that the skin gets pinched into by a tightly wrapped string. In 5 to 7 days, the strangulated foreskin and the plastic covering fall free from the penis or can be trimmed away, leaving a completely healed circumcision. The Mogen clamp pinches the foreskin beyond the head of the penis, where it is then trimmed off with a scalpel along the groove of the clamp.

After circumcision, caring for the penis is easy, but important. The area should be washed gently with warm water mixed with mild, unscented soap. A new bandage with antibiotic ointment can be placed with each diaper change.

Some swelling, redness, and perhaps a little blood are common early on, but if these problems persist several days or get worse or there is a fever, the baby should be seen by a doctor. Another indication for a doctor visit is a dry diaper for more than 12 hours following a circumcision.

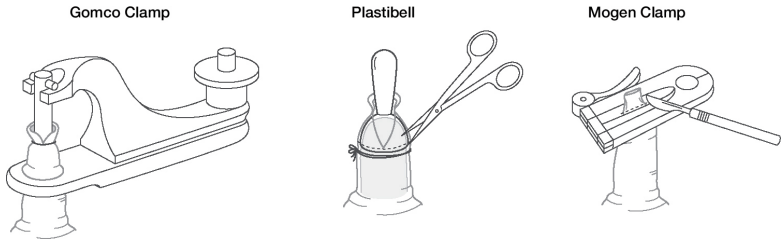


Figure 1 Techniques of newborn circumcision

Figure 2 Stages of healing following newborn circumcision

CHILD/ADULT CIRCUMCISION: Circumcision is more complicated for older boys and adults. The penis is bigger, so anesthesia is required and so are actual stitches. Devices are usually not used, but instead the skin is cut directly with a scalpel or scissors or both. The bandages come off the next day in a warm tub or shower. The stitches dissolve in about 7 to 14 days. Ice is helpful to reduce pain and swelling for the first day or two. Soaking the penis in warm water a couple times a day will keep it healing cleanly for the first week or two. Athletic activity and sex should be avoided until it is well healed, which can take 3 to 4 weeks. Clothing should be comfortably loose. Minor bleeding is common and usually just requires some pressure with a clean dressing for a few minutes.

Pros and Cons

For many centuries, newborn circumcision has been a hot topic of debate. On one side are those who argue that foreskin is a natural part of the male anatomy and should not be mutilated, saying that doing so may create potential negative psychological effects,

desensitize the penis, and subject newborn boys to numerous potential adverse medical complications. In an online survey, circumcised men reported less sensitivity and more discomfort in certain parts of their penis shaft and head compared to men who were not circumcised.[12] Actual testing of the nerve sensation of the penises of men who were and weren't cut revealed few to no differences, however.[13] Nor were there any differences in the ability to get aroused and erect.[14]

Benefits of Circumcision

The medical benefits of a newborn male circumcision are many, including:

- **REDUCED RATE OF URINARY TRACT INFECTIONS (UTIs):** Circumcised boys are less likely to have a UTI in their first 6 months of life, when they are most vulnerable. Over their lifetimes, 1 in 12 circumcised males experiences a UTI, compared with 1 in 3 uncircumcised males.[15]
- **REDUCED RATE OF FORESKIN-RELATED PROBLEMS:** Things can go wrong with the foreskin. Its delicate, floppy structure makes it more prone to get infections than the rest of the penis skin. Over time smegma, a combination of sloughed skin cells, can accumulate under the foreskin and cause inflammation and odor. Yeast likes to grow in the moist environment under the foreskin too. Foreskin infections are painful and they can lead to contractions and scarring resulting in a foreskin that is too tight to pull back, like a turtleneck you just can't pull over your head. Even without infections, the foreskin can become too tight, particularly as a man ages, and especially if he has diabetes or other conditions that curtail the bloodflow in the foreskin. This condition, called *phimosis*, affects approximately 10 percent of uncircumcised teens and adult men, and the treatment is circumcision. Even worse, but much less common, is *paraphimosis*, a condition in which the foreskin cannot be rolled back over the head of the penis. It becomes a medical emergency because the blood in the rolled-back foreskin can't circulate properly and the foreskin swells up and gets tighter and more swollen in what becomes literally a vicious circle (around the penis shaft). If you sport a convertible, never

leave the “top” down for too long.[16, 17, 18, 19, 20, 21]

- **REDUCED RATE OF SEXUALLY TRANSMITTED INFECTIONS:** Circumcised men have lower rates of catching and spreading certain viruses and bacteria.[22] Several medical studies have also shown that circumcision reduces the risk of female-to-male transmission of HIV by about 60 percent. This is because the foreskin is fragile and can tear during sex, allowing the virus to get into the blood. Also, the foreskin has a high concentration of a type of white blood cell called Langerhans cells, which the HIV virus likes to attach to. The protective effect occurs even if circumcision is performed on an adult. Based on these findings, in 2007 the World Health Organization endorsed circumcision as a way to help stop the spread of HIV.[23] Circumcision also lowers the risk of catching and spreading genital herpes, syphilis, chancroid, trichomoniasis (caused by *Trichomonas vaginalis*), and mycoplasma infection (caused by *Mycoplasma genitalium)*.[24]
- **LOWER RATES OF PENILE CANCER AND CERVICAL CANCER:** Genital warts are caused by one of the most common sexually transmitted viruses, called human papillomavirus, or HPV. Circumcision lowers the risk of getting genital warts. More importantly, certain strains of the HPV virus cause penile cancer and also cervical cancer in the partners of men with this infection. Penile cancer affects approximately 1 in 1,000 uncircumcised men over a lifetime. Infant male circumcision reduces penile cancer later in life by 95 to 99 percent.[25] Cervical cancer is 10 times more common than penile cancer, and it occurs 5 times more often in women whose male partner is uncircumcised.[26]
- **LOWER RATES OF PROSTATE CANCER:** Male circumcision lowers the risk of prostate cancer by about 15 percent if performed prior to his becoming sexually active. This may be because some prostate cancer is a result of a viral infection.[27]

A 2017 article in the *World Journal of Clinical Pediatrics* summed up the myriad benefits of circumcision this way: “Our risk-benefit analysis showed that benefits exceeded procedural risks, which are predominantly minor, by up to 200 to 1. We estimated that more than 1 in 2 uncircumcised males will

experience an adverse foreskin-related medical condition over their lifetime. Wide-ranging evidence from surveys, physiological measurements, and the anatomical location of penile sensory receptors responsible for sexual sensation strongly and consistently suggested that male circumcision has no detrimental effect on sexual function, sensitivity, or pleasure."[28]

Risks of Circumcision

There are several complications that can occur during or after circumcision, ranging from the insignificant to the tragic (i.e., severing of the penis). The overall rate is quite low, at 0.5 percent of all newborn circumcisions. Almost all of these complications are preventable with experience and proper technique. Most of these complications occur at the hands of novices who are neither urologists nor surgeons. There's not a large margin of error with a newborn penis.[29] Here is a rundown of the key risks associated with circumcision.

- **BLEEDING:** Excessive bleeding is rare but can occur.[30] In the ancient Jewish tradition, circumcision was not performed if two older brothers had already bled to death. (Hey, the first one could have just been a fluke.) This was likely a situation of hemophilia, a genetic bleeding disorder.[31]
- **INFECTION:** The circumcision wound may become infected, but the rate in newborns is very low at 0.4 percent, while in older boys it may be as high as 10 percent. Most of the infections are minor and are not of significant consequence. However, occasionally there can be a terribly severe "flesh-eating" infection resulting in severe permanent disability or death. The risks of bleeding and infection are greater with adult circumcision because there is more skin that must heal.

The remaining risks are more likely in newborn circumcisions, where the small size of the structure increases the risk of complications.

- **CONCEALED PENIS:** This condition occurs when too much skin is removed on the shaft but not enough from the tip, and the head of the penis gets retracted into the body by the short shaft skin while still being hidden by the excess tip skin. If

there is a large fat pad around the pubic area, the penis gets pulled to under the level of the skin of the fat pad and foreskin remains past the head.

- **PHIMOSIS:** If not enough foreskin is removed at the time of the circumcision, when it heals it may scar down back around the head and be too tight to roll back all the way. This requires a repeat surgery to fix it.
- **SKIN BRIDGE:** Sometimes, when the penis is healing, a small bridge of skin can form between the edge of the head of the penis and the edge of the shaft skin. It can get thicker with time and can tether the penis, making erections constrained or painful. Surgery is required to cut things loose.
- **NECROSIS:** A very rare complication of circumcision is the loss of some or all of the penis itself. This can happen if there is a severe infection or there has been a slip of the knife.
- **FISTULAS:** A hole below the normal urethra opening can form through the skin if the urethra gets injured during the circumcision and heals improperly. Sometimes a boy is born with the urethra opening up on the shaft before it reaches the tip of the penis. A boy with this condition, known as *hypospadias*, should not be circumcised as a newborn because the intact foreskin will be needed for a later surgery that will correct this problem.[32]

Circumcision Controversy

The American Academy of Pediatrics and the American Urological Association both acknowledge the risks but recognize the health benefits of circumcision as well. On the other hand, in the Netherlands, the Royal Dutch Medical Association called for a ban on circumcision in 2010, stating that it is "medically unnecessary and violates children's rights." The debate against circumcision is often framed in terms of human rights, but these arguments can also be construed as anti-Semitic or anti-constitutional. The issue is tricky, even medically, because some of the benefits of circumcision, such as cancer prevention, are lost if it is not performed on a newborn but delayed to the age of consent.

Restoring the Foreskin

For those concerned enough, there are techniques to "restore" the foreskin by using mechanical devices to stretch the remaining penis shaft skin slowly but surely until it covers the head of the penis once again. There are also surgical techniques that are infrequently performed.[33] Some work is being done on tissue engineering, and there are even foreskin substitutes made out of fabric or latex designed to be worn over the penis so as to make the head more sensitive over time.[34] Keep in mind, scientific studies show that the sensitivity of circumcised penises is not really different than that of uncircumcised penises, so these efforts may be a long run for a short slide, as it were.

Circumcision is a complex topic because it is not necessarily a personal choice. The advantages of circumcision are several, but some of these require the procedure to be performed before the age of consent. Cultural, scientific, and spiritual influences all come to bear on the decision. Careful scientific study has failed to demonstrate a significant difference in sexual sensation and function in men who are circumcised versus those who aren't. I personally have performed many circumcisions on adult men who suffered from foreskin complications, and they have not complained of negative impact on their sexual experience following the procedure. If circumcision is pursued, it is best performed at the hands of a trained medical professional.

CHAPTER 8

THE CULT OF PENISALITY: The Penis in History, the Media, and Cyberspace

Of all the organs of a man, the penis is the rock star. Sure, the brain is the smartest, but which organ is really in control? The balls are really the supporting cast, and they, for most purposes (except fertility), can be replaced with a testosterone shot. So it's not surprising that the penis invariably steals the spotlight in our overexposed entertainment universe. Let's look at some of the iconic moments in pop culture and politics in which the penis was surprisingly, ironically, or prominently featured.

The Penis: A Brief History

Think our culture's enthrallment with the penis is a modern fetish? Think again. The penis has long been a subject of interest throughout the world. In fact, it is arguably the most deified organ in human history, dating back even far before the ancient Greeks and Romans.

Perhaps the earliest example can be seen in Paleolithic engravings of the Los Casares cave in Spain and the Saint-Cirq cave in France. The engravings depict enormous penises. Were these the work of vulgar cave taggers? No, they emphasize the importance of the penis to survival and prosperity. In tribal society, mother worship was replaced by phallic supremacy once men realized their role in reproduction, with the penis becoming a symbol of both reproductive and agricultural fertility.

Even today, we can still see and feel the effects of this penis-centric attitude and the gender roles that came along with it. Hip-

hop machismo, with its crotch-grabbing posturing and sexual braggadocio, is just a modern-day echo of the emphasis given the penis by ancient kings who integrated phallic rituals into royal affairs, coronation rites, and inheritance of leadership.

With great power comes great responsibility. The Greeks believed the penis had the ability to avert the evil eye. Amulets and statues with a head, torso, and male genitals (called *hermae)* were used to ward off malevolent spirits and bring good luck.

Similarly, in Bhutan, erect and ejaculating phalluses are painted on houses near doorways and building corners to protect against the evil eye and malicious gossip and bring in wealth and luck. This is a practice that continues even today.

The penis has also been worshiped as a divine object capable of curing a variety of ailments. In fact, according to the Infancy Gospel of Thomas, the foreskin of Jesus Christ was said to have been preserved long after his death, with worshipers lining up, seeking a cure to their illnesses. Of course, by the start of the 21st century, no fewer than 21 different churches claimed to have the real deal.[1]

Even pornography isn't anything new: The 3,000-year-old Turin Erotic Papyrus, nicknamed the "world's first men's mag," depicts a variety of sex positions in 12 erotic scenes where men have unreasonably large, circumcised genitalia.

Ancient Greece and Rome are particularly well known for putting the penis on display through sculpture. But unlike in some other ancient civilizations, the penises displayed on Greek statues tended to be small and uncircumcised—an indication of the level of civilization of the man. Large penises were actually subject to ridicule because they were considered objects of lust, driving their owners to simple bodily pleasures instead of sophistication. Ah, yes, to be Greek and small, those were the days… .

Perhaps the ancient erotic text that has aged the best is the Kama Sutra, which not only depicts a variety of sexual positions but also details a sizing system designed to match each of the sexes with someone of the "ideal" size for them. Men may possess a hare (small), a bull (medium), or a horse (large), while women have genitals described as deer (small), mares (medium), or elephants (large).[2]

It's not just the human penis that gets people off, either. For

instance, the Icelandic Phallological Museum, located in Reykjavík, is home to a large (and some might say unsettling) collection of penises and penile parts, most preserved in jars or dried and mounted taxidermy-style. The museum contains more than 200 specimens belonging to mammals that can be found in Iceland—whales, bears, seals, walruses, and a variety of land mammals.[3]

The human penis has been the focus of anatomical interest and scientific (and sometimes not-so-scientific) study as well. The relationship between boys and their toys was psychoanalyzed (amidst great criticism, but with far-reaching implications) by Sigmund Freud in the late 1800s. To this day a cigar is never just a cigar and sexual connotations have become big business—sex sells!

Fair and Balanced Exposure

When it comes to the big screen, and the medium screen, genital exposure is anything but fair and balanced. Women's bodies have been the object of visual artistry and exploitation since Edison introduced moving pictures. The male body has been a very infrequent guest star. There is an increasing movement to change that afoot, or should I say a-penis?

Actors such as Kevin Bacon have pushed publicly for equal time for "sly and his family stones. " He calls for a movement to #FreeTheBacon: "By bacon," he explains, "I mean your wiener, your balls, and your butt." He implores *Game of Thrones* to add a little (or big) dick to its myriad sex scenes and even offers to play a "naked wizard" on the show.[4]

The 2016 Report on the Status of Women and Girls in California found that in 2014's top 100 US films, female actors were nearly three times as likely to have appeared nude as their male counterparts (26 percent compared to 9 percent).[5]

Game of Thrones itself has exposed more penises than many shows, but it certainly doesn't come close to showing male nudity on an equal scale: In the 60 episodes of the first six seasons, just eight penises have popped up on camera (only two of which belonged to main characters). Trying to count the number of times females were nude on camera would be quite the task, but it's safe to say that the vast majority of episodes aren't shy about

flashing female breasts, butts, or vulvas.[6]

In an industry that has long been unafraid of female sexual exposure, the penis is becoming the next big star: Shows and movies proudly and prominently featuring the penis often gain extra exposure and differentiation from other productions. Big-name shows like *Outlander, Spartacus, True Blood,* and *Oz* have all cashed in on the trend in recent years.

The West Wing? More like the Sex Wing

TV shows and movies aren't the only place where the love rod has played a starring role. Politicians and celebrities alike have often suffered or gained fame after their members found their way to the pubic—er, *public*—arena. One need only type in a phrase like "sex scandal" on Google to find myriad options available for exploration.

Though often feigning disgust over sex scandals and sex tapes, it seems the public just can't help but ferret out all the details when it comes to issues of sexual exposure. For better or worse, sex tapes have impacted the careers of many celebrities: Paris Hilton, Pamela Anderson and Tommy Lee (and Pamela Anderson and Brett Lee), Kim Kardashian and Ray J, Colin Farrell and Nicole Narain, Rob Lowe and two women (one underage), Hulk Hogan and Heather Clem, and even Dustin "Screech" Diamond.

Perhaps even more viral than celebrity sex tapes are stories of politicians who allowed their pricks to do the talking for them. Anthony Weiner should have won an award for the sexting scandal that just wouldn't stop. In a series of unfortunate events beginning in May 2011 and ending (we hope) in 2016, Weiner was found to have continuously sexted throughout his career. There can be no doubt that Weiner's wiener brought about the downfall of his career.

Even further, Weiner's penis unwittingly impacted the 2016 presidential election. When his computer was seized as evidence for a charge of sending obscene material to a minor, the FBI discovered emails that had been forwarded from his wife (Hillary Clinton's presidential campaign manager, Huma Abedin). The emails had originated between Clinton and Abedin and were sent on one of Clinton's notorious private servers while she served as secretary of state.[7]

Speaking of Hillary Clinton, she ought to be fed up with the sex scandal limelight by now: Not only did a sex scandal contribute to her defeat in the 2016 presidential election, but about half her time as First Lady was also overshadowed by her husband's own scandalous affairs. Aptly nicknamed "Slick Willie," President Bill Clinton's saga began in November 1995 when he engaged in a sexual relationship with then–White House intern Monica Lewinsky. After a 4-year investigation and an impeachment by the House of Representatives for perjury and obstruction of justice related to the affair, Clinton was eventually acquitted by the US Senate in 1999 and allowed to serve his full second term.[8] Sadly, the penis can be a bully, and numerous women have come forward recounting just how rampant sexual harassment is on both hills—Capitol and Hollywood.

Positive PR for the Penis

But the spotlight on the schlong isn't always negative, nor should it be. Through the hard work of artists and advocates, the one-eyed monster is slowly becoming less taboo to talk about. Celebrities like four-time NBA champion John Salley and Dr. Drew Ordon are promoting the destigmatization of men's health procedures by doing things like agreeing to let CBS's *The Doctors* film me performing a prostate exam on them.

"I cannot believe I am doing this. I would do anything for television," Salley joked nervously just before his exam. "It wasn't even 5 seconds," he said just after. "It's testing for it [prostate cancer]. We made jokes about it, but it was easy, and it's preventative."

Dr. Ordon was straightforward in his during-procedure observations: "I feel you," he said.[9]

Breaking down the barriers to conversations about men's health issues is essential. These are conversations that need to be had. If I can lighten the mood by telling a joke, it helps to erase some of the anxiety and nervousness that often keep men silent—sometimes dangerously so—about issues below the beltline.

Luckily, I'm not alone in my endeavor to discuss the dong in an open and unapologetic fashion. Photographers like Laura Dodsworth and Soraya Doolbaz, as well as portrait artist Pricasso, are making their own headlines by zeroing in on this taboo topic

through a creative lens.

Dodsworth's book *Manhood: The Bare Reality* tells the stories of 100 penises in pictures and words. Featuring 100 men aged 20 to 92 and their members, the book explores the relationship each man has with his penis (and, to a lesser extent, his balls)., Dodsworth shares a wide variety of penises: black, white, massive, micro, embarrassed, proud, circumcised, uncircumcised, and even surgically constructed. Some penises are there for their 15 minutes of fame, but others are there to share their story with the world—and maybe make a difference.

"It's going to be so reassuring for a lot of men, particularly young men," Dodson said in an interview with Simon Hattenstone featured in *The Guardian*. One of the interviewees in the book talks about his experience with testicular cancer, which he suspected nearly a year before seeking help because he was too embarrassed to do so. "It [the penis] is so often subject to ridicule. It's like baseline standard male banter. Half the people in the world have got penises. It's unfair to be cruel about them," he said.[10]

Soraya Doolbaz is another photographer making the member more mainstream. A self-described "professional penis photographer," Doolbaz dresses dongs up in outfits the Internet has dubbed "adorable." From the festively festooned Christmas-themed cock to the leather jacketed Kanye West–themed dick, there's a little something for everyone in her collection. Her project, lovingly dubbed Dicture, features dozens of divas and even some dick-tators.

"My goal with all this was to make people laugh," she writes on her Web site. "I wanted to create comfort and confidence around sexuality for men and women. Men should be proud of their dick regardless of its size or characteristics."[11]

Other artists are using the penis in a different way to propel them to fame, including Tim Patch, aka Pricasso, a performance artist who uses only his penis as a paintbrush—with video evidence provided as proof of authenticity, of course.[12] Known throughout the world for his unique style, Pricasso has painted portraits of the rich and famous, from Hugh Hefner to Nelson Mandela to Einstein to President Donald Trump. He even works on commission, as one urology department chairman I know can attest—his residents commissioned a work of art for him.

Performance artist Simon Morely has taken what most boys do in the shower and brought it to the worldwide stage with his puppetry of the penis. He and his band of orgasmic origamists pull, twist, and stretch the imagination of audiences from London to Vegas. Of course, it's only fitting that they come from Down Under.[13]

Some of these projects may seem silly and lighthearted at first glance, but each is playing a role in getting people more comfortable talking about the penis and, by extension, opening the door to crucial conversations about men's health.

(Over)exposure?

In the old days, if you wanted to show a stranger your penis, it took some planning. You had to strip down, put on a long raincoat, and lurk in some dark corner of the street, waiting for an unsuspecting passerby to flash.

It's so much easier now! Cell phones and the Internet have taken flashing to a whole new level. From the basic sext to dating and hookup apps like Tinder, sexual exposure and up-front overtures have been brought into the 21st century. There's even an app that predicts penis size.[14] Is this phenomenon just picking up where the Summer of Love left off? Are we more liberated? Better informed? Or are we just more exposed?

There's an App for That

Technology is everywhere these days—including in the bedroom. Whether it's getting tips on how to have better sex with your partner or matching sperm and egg donors, there's probably an app for that.

In the realm of spicing things up in the bedroom, we have SexPositive.[15] Brought to you by the University of Oregon, SexPositive uses a simple wheel format that lets you match up parts of the body to see what happens when those parts touch each other. It also offers relationship communication advice and everything you need to know about sexually transmitted infections (STIs) and safe sex. The app's main goal, according to its creators, is to encourage communication and consent.

Of course, sometimes it's not just about the deed but what

happens with the seed. That's when you can turn to apps like JustaBaby,[16] designed to connect sperm and egg donors, as well as surrogates. While the legal elements of procuring sperm or eggs outside of the medical profession may still be up in the air, there's no doubt that the "typical" family is a thing of the past. Particularly for LGBTQ couples, traditional baby-making options aren't going to cut it. So an app like JustaBaby could be a way for these folks to swipe right on the family of their dreams—provided they keep the legal elements in mind.

And then there's Tinder,[17] perhaps the most notorious dating app of all time (all right, maybe it shares the limelight with its close cousin Grindr). Ostensibly a dating app, Tinder's community guidelines specifically prohibit dick pics and other methods of "exposure" ("If it's in the Kama Sutra, it probably shouldn't be in your profile pic").[18] But there's no shortage of Tinder-related stories about harassment, scams, and, unfortunately, rapes.

And that's not the only kind of exposure possible with apps like Tinder: Your personal information could be at risk too. Thanks to the wonders of modern technology, data on Tinder profiles is sometimes "scraped," or copied in full and made available to the public domain. Just recently, in fact, a data set made up of tens of thousands of Tinder users' photos and personal information was made publicly available and downloaded hundreds of times before finally being taken down. The code used to perform the deed, however, is still readily available to coders in the know.[19]

There's nothing inherently wrong with dipping your toe into online exposure with apps like these. But with great technological power comes great responsibility, and it's up to the user to know when to let it all hang out and when to keep it in your pants—both literally and metaphorically.

Gussying Up the Gravy Maker

If the limelight is heading south, naturally there's going to be a desire to spruce things up down there. Cue the increasing popularity of manscaping. That's right: manicures for your merry maker.

From the deep wilds of the Amazon to the barren lands of the Sahara to the mysterious lines of Nazca, the possibilities for your

peacock's appearance are nearly endless. Some men prefer a totally smooth, hairless style, while others like a little fur to keep them warm. What do the statistics say? In one study, 75 percent of male participants had recently shaved or trimmed hair around their groin area. Of males who shaved off pubic hair, 32 percent reported heightened sexual experiences.[20]

But one thing's for certain: No matter the landscape, make sure you're getting the job done right. First, make sure you have a dedicated set of tools for the job. Just like you wouldn't use the same toothbrush for your teeth as for your dog's, don't use the same scissors for your pubes as you would to open that package of raw chicken for dinner.

Not only do you need to avoid bringing unwelcome bacteria *to* your nether regions, but you also want to avoid taking bacteria *from* those regions to other places. Yeast, fungi, and bacteria all thrive in warm, moist places (aka the male groin area), especially in cases of poor hygiene. To ensure you don't spread any bacteria, wipe down your tools with rubbing alcohol before and after each use to sterilize them and lower the risk of infection. And of course, give your candy cane a good rubdown beforehand too. (No, not *that* kind of rubdown. The kind with soap.)

Manscaping has other risks too. Shaving can cause skin irritation and bumps, plus some crazy itchiness when the stubble inevitably pops out. So, what's a man to do? Try these tips to make your manscaping adventure a little less perilous.

- Use trimmers to shorten the pubic hair before shaving.
- Exfoliate Rumpleforeskin…gently.
- Take a hot shower to open the pores, soften skin, and get rid of any pesky dirt or oils.
- Use preshave oil to lift the hair up, add hydration, and prevent irritation.
- Avoid products that could cause ingrown hairs, such as fragrances, mineral oil, cooling agents, or citrus.
- Shave, wax, or epilate.
    - If shaving, always use a sharp razor and shave gel. Be prepared for nicks and cuts with soothing balms such as shea butter, cocoa butter, and aloe vera.

- Waxing is your best bet if you plan on keeping it "baby smooth" down there and want to avoid the hassle and irritation shaving can cause.

- Epilating is like waxing in that it pulls out multiple hairs simultaneously, but it does so without removing cells from the epithelium of the epidermis. However, epilators may be particularly painful to use the first time, so many people recommend getting waxed the first time and then epilating to stop regrowth.

- Finish up the job with some postshave moisturizer to reduce skin irritation and itchiness.

So, what'll it be? *Baywatch* bod or more au naturel? The choice is yours.

Games Penises Play

Once you're all gussied up, it's time to get out there and play! In this day and age, the options are endless—and more readily available than ever before. From glow-in-the-dark condoms to cock rings to full-size, fully functional sex dolls, there may just be something for everyone. Herein may lie the answer to the question, "What do you get the man who has everything?"

First off, the wonders of technology have extended far beyond just connecting potential partners. The new wave of "teledildonics," or the combination of telecommunications and sex toys, is on the rise with products like iPod vibrators (a vibrator/iPod collaboration),[21] the Vibease (a smartphone-controlled vibrator that can even sync up with a selection of erotic novels),[22] and RealTouch (a male masturbator that can "do all the work for the guys" by plugging into a computer USB port and syncing with porn).[23]

These kinds of toys are particularly interesting because they facilitate intimate encounters that can be entirely virtual. As OhMiBod founder Brian Dunham noted, "Nowadays, teenagers'… first experience with intimacy can be virtual, can be through Snapchat. Through a sexy text message or a naughty Facetime session…. Our mission now is to create products that facilitate that and bridge this intimacy gap. Looking ahead into the future,

it's about the different ways you can create intimate moments with your partner, virtually, that will lead to a physical connection."[24]

Of course, even in a primarily virtual encounter, there's likely to be some sort of gunk going on your junk. And that means it's worth paying attention to just what's in the bits that touch *your* bits.

Increased research in this area has led to more options when it comes to things like vegan lubricants and other eco-friendly materials. Retailers like Good Vibrations and Babeland actually host green product lines that capitalize on the "ecosexuality" trend. In 2007, for example, Good Vibrations became the first retail channel to stop carrying products created with phthalates, a type of chemical rubber softener often used in sex toys. Its reasoning? Phthalates have been shown to cause cancer in lab rats when administered in high doses, leading then-governor of California Arnold Schwarzenegger to sign a bill banning their use in children's toys.[25] If a chemical is unsafe for children, it's probably not what you want on your dick.

Not ready to go all natural? Little things like using rechargeable batteries—or even solar power—are other increasingly popular ways to go green in the bedroom.

If novelty is more your priority, there are toys catering to that as well. For those looking for a truly equal experience, there's the multi-functional sex toy. Case in point: The PicoBong Transformer (available with a 1-year warranty from Amazon!) functions as a clitoral massager, G-spot stimulator, cock ring, prostate massager, and more.[26] All right, so it may not be the most aesthetically pleasing toy, but there's nothing like a sex toy with multiple functions to encourage sharing in bed. (Just make sure to keep up with proper hygiene practices when playing with this one!)

Not finding the perfect toy for that special someone? It may only be a matter of time. As of 2016, adult novelties were a $15 billion industry projected to rise to $50 billion by 2020.[27] The more comfortable we get with exposing ourselves, likely the easier it will be to get the man who has everything something he never even knew he needed.

PART TWO

How To Work It

CHAPTER 9

THE LOWDOWN: Causes of Erectile Dysfunction

Erectile dysfunction is the inability to keep the penis hard enough, long enough for satisfying sex. It wasn't all that long ago that the topic of erectile dysfunction, or ED, was relegated to "don't ask, don't tell," principally because we docs didn't want to talk about it since we really didn't understand it and there wasn't much we could do about it. Sadly, when medical conditions are not well understood we sometimes blame the patient, telling him "It's all in your head." But fortunately, in the 1980s we started to figure it out, and we realized that most of the time erectile dysfunction actually wasn't just "in your head." The discovery of Viagra and its various spin-offs provided an easy-to-prescribe, effective remedy. Now patients and doctors can't shut up about ED, not to mention every other commercial on any given Sunday.

Now that's not to say that erection problems are only physical. Your biggest sex organ is actually between your ears—it's your brain. It takes in visual and other sensory erotic stimulation and converts it into a signal to your penis. Your brain is where it all starts, and it's where it can all end too. Thoughts alone can release adrenaline, which can short-circuit the penis and prevent it from getting or staying hard. Pornographic images can change our brain structure and chemistry for the worse. Fortunately, skilled behavioral health specialists have techniques that can help refresh the mind and restore confidence and satisfaction to the owner of a less-than-peppy penis.

How do you know if you are experiencing erectile dysfunction or just a little off your game? There is a questionnaire we doctors use to help sort that out. It's a series of five questions that are scored from 1 to 5, with a total of 22 to 25 considered normal.

The questions are regarding your experience over the past 6 months. The first question asks how you rate your confidence that you could get and keep an erection. Answer options are 1: very low, 2: low, 3: moderate, 4: high, or 5: very high.

The second question asks how often your erections were hard enough for penetration when you were sexually stimulated. Answer options are 1: almost never, 2: a few times (much less than half the time), 3: sometimes (about half the time), 4: most times (much more than half the time), or 5: almost always/always.

The third question asks how often you were able to maintain your erection during intercourse after you penetrated. Answer options are 1: almost never, 2: a few times (much less than half the time), 3: sometimes (about half the time), 4: most times (much more than half the time), or 5: almost always/always.

The fourth question asks how difficult it was to maintain your erection to the completion of intercourse. Answer options are 1: extremely difficult, 2: very difficult, 3: difficult, 4: slightly difficult, or 5: not difficult.

The last question asks how often sexual intercourse was satisfactory for you. Answer options are 1: almost never, 2: a few times (much less than half the time), 3: sometimes (about half the time), 4: most times (much more than half the time), or 5: almost always/always.

A score of 12 to 21 is considered mild erectile dysfunction. A score of 12 to 16 is considered mild to moderate erectile dysfunction. A score of 8 to 11 is considered moderate erectile dysfunction and a score of 5 to 7 is severe dysfunction.

Let's Get Physical: Medical Causes of Erectile Dysfunction

So why might the flag fly at half mast? The most common reason is a problem with bloodflow due to narrowing of the arteries. Many conditions can lead to this, including diabetes, high blood pressure, and heart disease. In fact, having trouble getting an erection may be your first and only warning sign of a looming heart attack or stroke. Some medications that treat high blood pressure can make erections worse! So this can be a case of damned if you do and damned if you don't. Nerves are critical

too, and diseases or injuries of the nerves to the penis prevent normal bloodflow. Spinal cord injury, neurological diseases such as multiple sclerosis, certain surgeries in the pelvis, and medications such as antidepressants all can short-circuit the ability to switch on. Low testosterone puts the penis on Snooze, and some medical conditions and medications can lower testosterone. Cigarettes, drugs, and alcohol all are a buzzkill for your penis.

Aging

The most common cause of erectile dysfunction, however, is a disease with no cure: aging. As men get older, erection problems pop up. Now, some guys are less affected than others, but by and (not so) large about 40 percent of men will have some degree of problem by age 40. In most cases the problem is mild—occasional difficulty getting it hard and/or keeping it hard. Just a little off your game now and then. But for a small percentage of guys, it's quite severe. As the decades pass, the percentage of men with erectile dysfunction goes up in lockstep. So 50 percent of men have some degree of problem at age 50, 60 percent have some degree of problem at age 60, and so on. Furthermore, the severity worsens with age.

Time is like a lumberjack sawing away at your mighty oak. Eventually the blood vessels that pump up your penis become more brittle and narrow. At only 1 millimeter in diameter, these arteries are a fraction of the size of the coronary arteries that supply blood to your heart muscle or the carotid arteries that supply blood to your brain, so the penis can be the first to go, well before a heart attack or stroke.

From the day you enter this life, your cells are under attack from a process called *oxidation*. This is the same process that causes steel to rust. The attack comes from molecules called "free radicals." The natural balance of smooth muscle and collagen in your blood vessels is destroyed over time by free radicals, as smooth muscle cells disappear and get replaced by more and more collagen, making your blood vessels stiff and narrow Fortunately, your body has a defense mechanism. Molecules known as antioxidants are naturally produced to block those free radicals from doing their damage. One of the key antioxidants is

nitric oxide (NO). It is produced from the very innermost lining of the blood vessels, the *endothelium*.[1] As you age, your ability to both produce nitric oxide and to benefit from it declines. Scientists call this "endothelial dysfunction." Poor food choices, bad habits such as smoking and being sedentary, as well as toxins in our environment all dump more free radicals into our systems. Add to this natural decline disease states such as diabetes, high blood pressure, high cholesterol, and low testosterone, and erection problems become even more severe.

Some aspects of aging seem to be inevitable. Your nerve endings atrophy over time, and so your penis will become less sensitive over time as well. Use it before you lose it![2] This should come as no surprise, considering that all our senses dim as we get older. The drop-off is gradual so most of us don't really notice it as it is happening, but over time it's normal to require more stimulation to get and keep an erection. If you have other medical causes for your erectile dysfunction, the decreased sensitivity adds insult to injury. This may be why you can get away with certain lifestyle behaviors when you are young that you can't handle as you approach and pass middle age. A guy in his twenties could go off on a bender and still rise to the occasion, but men in their fifties or sixties may find it hard to pop their cork after a couple glasses of wine.

Age also steals your testosterone. Not all, but most men will make less and less testosterone over time. The testicles start to wind down, and more and more of the testosterone they do make gets bound up by certain molecules that stick to the testosterone and prevent it from doing its thing.

Good nutrition and exercise are key to slowing the ravages of time. Eating a diet rich in nitrates can sustain your youthful cellular balance longer by providing a source of NO. Fresh, unprocessed, plant-based foods such as vegetables, fruits, nuts, legumes, and grains are the best source of nitrates and thousands of other molecules, many of which are key antioxidants that counteract the aging process. Wouldn't you rather enjoy some fresh berries than swallow handfuls of medications? Regular exercise also triggers the release of NO and other antioxidants. Excess fat releases toxic free radicals, so staying lean is key as well. Most of my very-advanced-age patients are skinny old men. Excess fat can also reduce testosterone by turning it into

estrogens, the female hormones. The sooner you put into practice good nutrition and exercise, the sooner you claw back some time. It's never too late, but the fact is that the body takes some time to repair itself, and some degree of deterioration is simply not reversible. A 40-year-old who starts to notice some mild inconsistencies with his erection can improve his diet and exercise and, within months, may notice improvements. A 70-year-old with more severe erectile dysfunction may not be able to get back to normal but could prevent a bad problem from getting worse, and may actually respond better to pills like Viagra than he used to. An 18-year-old who eats well, exercises from a young age, and avoids cigarettes, drugs, and excess alcohol may go his whole life without a significant problem, assuming no other illnesses crop up to interfere with his circulation and bloodflow to the penis.

Not everyone who ages gets sick, but over the course of your life, odds are greater than even that you will develop a medical condition that causes erectile dysfunction. Furthermore, erectile dysfunction may be your earliest warning that you are developing a life-threatening condition. Men with erectile dysfunction have a greater than 50 percent chance of developing cardiovascular disease. This means more than 40 percent of men with ED will go on to have a heart attack and almost the same percentage to have a stroke.[3] So if you develop ED, seek treatment not just for your love pump, but for your heart pump too. If you can't get it up you better bring it up with your doctor because not only will you save your *sex* life, you may save your *whole* life. Many factors contribute to cardiovascular disease including elevated cholesterol, diabetes, hypertension, smoking, obesity, poor diet, and a sedentary lifestyle. Prevention is better than treatment, but in all cases, there are remedies.

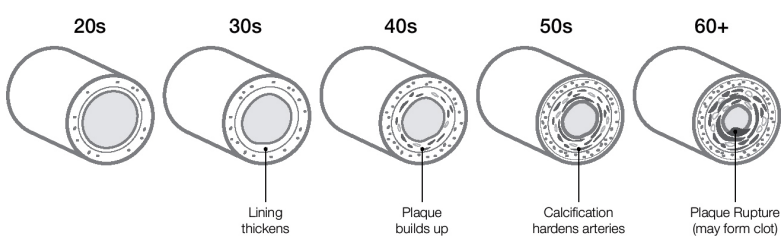


Figure 3 The damage to your arteries from aging

Elevated Cholesterol

Elevated cholesterol leads to injury of the endothelial lining of blood vessels, resulting in rupture of the lining and plaque buildup, narrowing of the arteries, and eventual loss of bloodflow to the penis. A class of medications known as statins reduces cholesterol but can cause some sexual side effects in some men. Nonetheless, statins can help men with poor erections due to cholesterol plaques recover their sexual function.[4] Men with ED due to cardiovascular disease can improve their erections with medications such as Viagra or Cialis, which increase the bloodflow through the narrowed arteries. If the condition is too severe, pills won't work, but other remedies still can.

Cardiovascular disease can be reversed gradually over time with diet and exercise, especially a primarily plant-based diet with minimal simple carbohydrates, minimal simple starches, minimal animal products, and minimal oils. I know, delicious, right? Well it can be, and it's a lot better than the alternative. In fact, a long-term study at the Cleveland Clinic demonstrated that the most severe cardiovascular "cripples" became healthy and lived for decades if they adhered to such a diet.[5] Regular exercise is key as well, but make no mistake, diet is probably more than 70 percent of the equation.

Diabetes

Diabetes attacks your penis from multiple fronts. The fundamental problem is sugar molecules floating around in your blood instead of being packed away into your cells, where they belong. This wreaks havoc on all your body tissues, and some parts show signs of damage before others. Diabetes causes endothelial dysfunction, ruining the ability of blood vessels to release normal levels of NO. This leads to plaque buildup and clogging of the arteries. The damage is particularly serious for smaller blood vessels and capillaries. The poor bloodflow through these very small blood vessels results in damage to the nerves that they provide oxygen to, especially the smaller nerve endings. Guess what has small blood vessels and small nerve endings? Look down if you need a clue. The nerve damage decreases the sensation in the penis. Even worse, it short-circuits the signal to

pump up the bloodflow for an erection. Finally, if the signal gets through, the blood vessels of the penis are too damaged to pump up the erection fully. There is also weakening of the muscles at the base of the penis that help trap the blood in the penis. Diabetes also damages the nerves that allow you to ejaculate. You may be left shooting blanks. Your semen may shoot backward into the bladder because the bladder doesn't close properly due to nerve damage. Diabetes often runs hand in hand with low testosterone production, weight gain, increased cholesterol, and high blood pressure—all of which create the perfect storm to sink your love boat.

Although diabetes can cause erectile dysfunction, the damage can be prevented or slowed down with tight control of blood sugar. Put down the candy bar and pick up the celery stick. Not only does cutting out simple carbohydrates decrease the damage, boosting your intake of fresh vegetables may actually reverse some of the damage done. Sugar is hiding everywhere in the food we commonly eat. Cut out sugary sodas—that's a no-brainer. Also, fat-free foods are laced with sugar to make them taste better than they should. Sugar is hidden in the form of starches just as often as it's turbocharged in the form of high-fructose corn syrup. Exercise helps as well, boosting antioxidants in real time and burning off the excess fat that also results from diabetes. In fact, exercise has been shown to decrease the chances of developing diabetes by up to 50 percent![6] If you cannot control your diabetes with diet and exercise, adhere closely to your medication protocol. The key is keeping the fasting sugar level close to 100 milligrams per deciliter (mg/dl) and the hemoglobin A1c (a longer-term measure of sugar control) under 5.7 percent. For every percentage point increase in hemoglobin A1c, there is a 55 percent increase in the chance of having erectile dysfunction.[7] Also make sure your testosterone level is normal because testosterone helps your body respond better to insulin.

High Blood Pressure

High blood pressure can give you low penis pressure. Over time, under abnormally high pressure, blood vessels react, increasing the amount of smooth muscle to handle the pressure. This makes the artery walls thicker and less elastic, which narrows the

passageway for the blood to flow into the penis. The blood vessels can become damaged and then develop plaques, blocking the blood vessels even more.

Table 1: Stages of High Blood Pressure in Adults

STAGES	SYSTOLIC READING (TOP NUMBER)		DIASTOLIC READING (BOTTOM NUMBER)
Prehypertension	120–139	OR	80–89
High blood pressure Stage 1	140–159	OR	90–99
High blood pressure Stage 2	160 or higher	OR	100 or higher

To make matters worse, some of the most commonly prescribed medications to treat high blood pressure actually cause erectile dysfunction because of their effects on the blood vessels and on the brain. The worst culprits are medications known as beta-adrenergic receptor blockers, aka “beta-blockers.” The most common one is propranolol, but most medications ending in *–olol* are in this category. These medications decrease the flow of blood into the penis, interfere with the relaxation of the small blood vessels to open up and accept the blood, and interfere with brain signals that normally switch on the penis. One commonly prescribed medication, atenolol, can lower testosterone levels. Thiazide and clonidine interfere with erection-stimulating hormone signals from the hypothalamus in the deep brain.

Even though blood pressure medications may cause erectile dysfunction to some degree, they help more than they hurt. When high blood pressure is brought under control with medications, better erections can occur in as little as 6 months.[8] Some blood pressure medications affect your penis less than others. Nebivolol is a beta-blocker with fewer side effects. Blood pressure medications known as ACE inhibitors (angiotensin-converting enzyme inhibitors) and angiotensin receptor blockers do not affect erections, but they don’t work for everyone with high blood pressure. When blood pressure medications are necessary, prescription pills such as Viagra can still restore erections, and

these medications are usually safe to take together. The medication that is dangerous to take with these “boner” pills is nitroglycerine or medications that contain nitroglycerine. The combination can cause a lethal drop in blood pressure, leading to cardiac arrest.

Proper diet and exercise can prevent or cure high blood pressure and restore good erections. Added salt and sugar both increase blood pressure. Caffeine raises blood pressure, so maybe think twice about that second cup of coffee, or third, or fourth. Exercise improves erections in men with hypertension in as little as 8 weeks.[9] Exercise turbocharges the effectiveness of NO and other nutrients to heal the blood vessels.

Smoking

Smoking used to be very sexy, but most people have wised up. Cigarettes aren’t just bad for your lungs, they are poison for your pecker. The smoke contains free radicals and heavy metals that damage the blood vessels to your penis and choke off the essential NO. Smoking dramatically accelerates the damage done by high blood pressure and diabetes. Men who smoke have a 50 percent chance of developing erectile dysfunction. Men who smoke and quit still have a 20 percent chance.[10] Even secondhand smoke gives you a 1 in 3 chance of flaming out in bed.[11] Vaping and nicotine patches are better than inhaled smoke, but the nicotine still squeezes off your bloodflow, so completely quitting is the best. The good news is that quitting can result in improvements in as little as 8 weeks.[12]

Obesity

Being fat is bad for your fatty. Excess fat releases toxins that continuously assault the blood vessels with free radicals. Furthermore, the excess fat sucks up testosterone, converting it into estrogen, the female hormone. With low T and higher E, you get a weaker erection with a side of man boobs. Combine diet and exercise to lose weight and bump up the NO, and you can see a difference.

The good news is that you really can turn things around.[13] The improvements won’t come overnight, but studies indicate

that close to a third of men with erectile dysfunction may get back to normal without medications.[14]

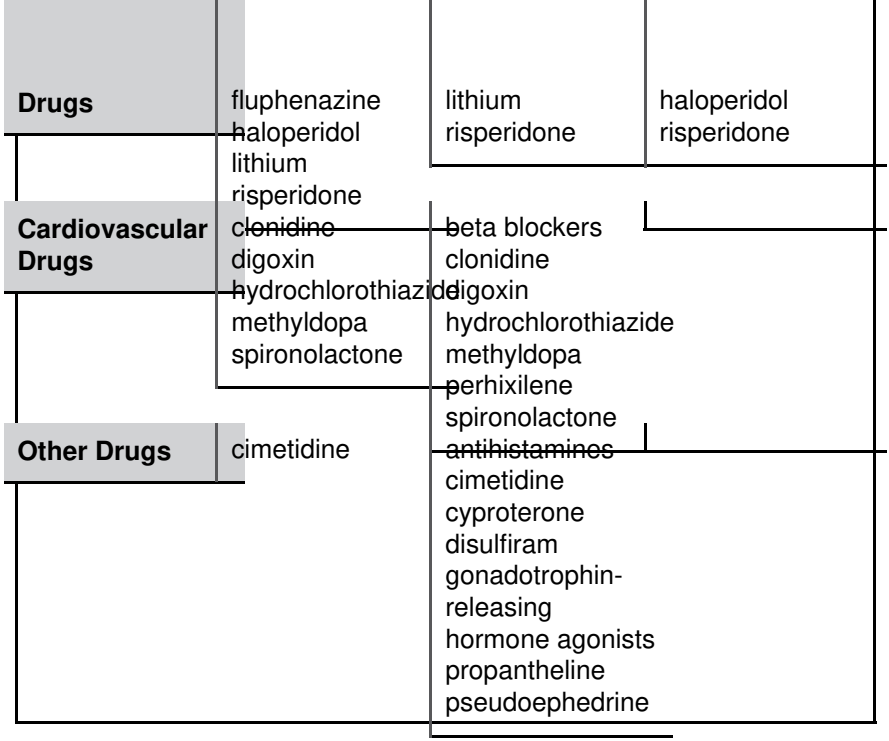
Neurological Conditions

The brain is your biggest sex organ, organizing all the sensual sensations coming in from the penis and other nerve endings, as well as the naughty thoughts bouncing around inside it, and orchestrating an appropriately naughty response that it sends down the spine back to the penis. So conditions that affect the nervous system from the brain to the spine to the nerves of the penis can cause erectile dysfunction.

Parkinson's disease causes dopamine-producing cells of the brain to die off. This, along with stiffness and difficulty moving, depression, and dementia, all contribute to poor sexual function. Other forms of dementia due to Alzheimer's disease and stroke damage brain cells and weaken the signals to the penis. Multiple sclerosis affects the brain and the spinal cord and can attack normal sexual function from both levels.

Table 2: Drugs Associated with Sexual Dysfunction

DRUG CLASS	DECREASED DESIRE	DECREASED ERECTION	ORGASM OR EJACULATORY DIFFICULTIES
Antidepressants	amitriptyline clomipramine fluoxetine imipramine paroxetine pheneizine sertraline	amitriptyline citalopram clomipramine doxepin fluoxetine imipramine nortriptyline paroxetine pheneizine sertraline tranylcypromine	citalopram clomipramine doxepin excitalopram fluoxetine fluvoxamine imipramine nortriptyline paroxetine sertraline tranylcypromine venlafaxine
Other Psychotropic	alprazolam chlorpromazine	chlorpromazine fluphenazine	alprazolam fluphenazine



Viagra and similar medications that increase bloodflow to the penis can help these men. Furthermore, medications that treat these underlying diseases may also improve sexual function. In fact, some men with Parkinson's can become hypersexual because their Parkinson's medication can raise the levels of dopamine in their brain too high.

Truama, disease, or surgery can injure the spine. A spinal injury interrupts the two-way flow of information from the penis to the brain and back. The sensations from the penis cannot make it to the brain to tell the brain it's time to start an erection. Furthermore, sexual images, feelings, and thoughts cannot send their stimulating signals down to the penis. If the spinal injury is high enough, the penis can get some signal from a reflex nerve loop in the lower spine. That weaker signal is enough to respond to a pill like Viagra. If the injury is below the level of the spine that conducts the reflex to the penis, then the reflex won't happen and pills may not work.

Pelvic trauma or surgery can injure the nerves carrying the signal from the penis to the spine and back. These nerves travel from the spine to the penis between the prostate and the rectum, so surgery on either of these structures can cause erectile

dysfunction if the nerves get squeezed, crushed, burned, or even severed during the surgery. The injured nerves sometimes heal, but very slowly, taking up to a couple of years. Radiation to the pelvis also injures those same nerves, but not quite as badly. Pills such as Viagra or Cialis may not work if the injury is severe. Instead, injections directly into the penis of a more powerful medication may work, or a vacuum erection device can be used. These are covered in more detail in Chapter 11, Now What? When Pills Don't Work. Penile implant surgery is also an excellent remedy when the other methods are not successful.

Bicycle Riding

Exercise is great for the penis; however, bicycle riding occasionally can damage the blood vessels or the nerves to the penis because they are situated under the butt bones (*ischial tuberosities*) and get squeezed by the narrow bicycle seat. This often causes some brief, temporary numbness in the penis and testicles. Sometimes the damage is more extensive and requires days or months to heal. The best strategy when this happens is time off the seat (and finding another sport) and the use of pills like Viagra to allow more blood to flow through the injured/narrowed artery and compensate for the injury. Even more rare is trauma that severs the pudendal artery. This can require surgery to bypass the injury with a new blood vessel connection—like a cardiac bypass, only for the penis.

Major Illness

When the body is really ill, the penis is too. Kidney failure and dialysis result in poor blood vessel health as well as low testosterone, both of which knock out erections. Liver cirrhosis, most commonly from alcoholism, also lowers testosterone. HIV often causes low testosterone levels. Testosterone replacement and penis pills are helpful in these cases.

Stage Fright: Behavioral/Psychological Causes of Erectile Dysfunction

Sometimes the problem really is all in your head. After all, your brain chemistry and nerve connections are essential for giving the command to hoist the mainsail. Sometimes you lose command of your ship to a mutiny of thoughts or feelings that you don't really want at that time, in that place. In many cases it's a quiet insurrection, where a subtle thought gives you just enough anxiety to sink your ship. More and more, the problem is that your brain can be pirated by too much pornographic imagery. This resets your compass, causing you to seek less familiar sexual shores but, in reality, leaving you floundering sexually in a sea of streaming smut.

Adrenaline is the fight-or-flight hormone our body releases when we are faced with danger. Danger makes us feel anxious, and anxiety triggers the release of adrenaline. Adrenaline then shunts our blood to our heart and lungs and away from our smaller parts like fingers and toes and the penis so that we can survive a physical attack without dying from blood loss. This is a critical safety feature that probably saved many a caveman from mauling predators. It's rare that we have the need to shunt our blood away from our smaller parts in order to survive these days. There are no longer saber-toothed tigers chasing us around, but there certainly are many modern causes of anxiety. But herein lies the rub: If you are anxious because you just lost your job, you may release adrenaline, but your circulation can't tell if the adrenaline is from a psychological cause or a physical injury and so it shunts the blood away from your penis. Significant stress from daily life can spill over into erectile dysfunction.

But the adrenaline trigger can be even more subtle. Let's say you were under the weather, but tried to have sex anyway and had some physical trouble. Or perhaps you had too much to drink so you suffered from "whiskey dick." Either way, you may get distressed by this failure and start to wonder if something is seriously wrong with you. The next time you go to have sex, it can play on your mind and you might ask yourself a very simple but very anxiety-provoking question: "Will I have trouble having sex LIKE I DID THAT TIME BEFORE?" The adrenaline release then prevents your erection and reinforces your anxiety. Now, the next time you have the opportunity for sex, you may experience an even *more* profound adrenaline surge as you ask yourself the adrenaline-inducing question, "Will I have trouble having sex

LIKE I DID THE LAST TWO (OR MORE) TIMES?" And then you *do* have trouble—again—and then it becomes a vicious circle. Once there is a negative feedback loop set up, performance anxiety sets in. The fear of not being able to perform can become a self-fulfilling, consuming state of mind and body.

One solution for this condition is called "sensate focus." This is a technique developed by Masters and Johnson, pioneers in behavioral sexual medicine. A behavioral health specialist can guide you through it. The basic idea is to have affectionate contact with your partner in five stages that gradually build up to sexual intimacy.

Sensate Focus

The first stage of the sensate focus technique is spending 10 minutes simply touching each other's hands and feet while otherwise clothed. Focus on the pleasure you receive rather than on what you are giving. Stage 2 builds on stage 1, and breasts and genitals are now in play to be touched. You once again each take a 10-minute turn, but you may guide your partner's hand around to the spots that make you feel good. Stage 3 is where you stop taking turns and touch each other at the same time. Now you can start focusing on your partner's pleasure. Stages 4 and 5 bring you right up to the edge of sex. You allow your partner to straddle you in a superior position and rub her genitals against yours whether or not you are hard. If you do become hard, your partner can insert you in just a little bit. If you get anxious, you can always drop back to a lesser stage of intimate contact and build back up until you are ready for intercourse. The goals of sensate focus are to help you focus on pleasure instead of performance and also create a closer feeling of connection to your partner to allow you to have sex without feeling anxious.[15]

Depression

Depression can go hand in hand with anxiety and can lead to sexual dysfunction as well. Causes can range from low self-esteem to high stress at work. More serious crises—such as posttraumatic stress syndrome from combat or previous sexual abuse—can be causes as well. Professional treatment for depression and anxiety

can improve sexual function in many of these cases. Sometimes men aren't able to realize they are depressed or anxious because they are so used to keeping their emotions in check due to social norms. Although medications can lift the depression, sometimes they lower the erection. Commonly prescribed antidepressants such as Prozac work by boosting serotonin in the brain. Unfortunately, serotonin suppresses oxytocin, a brain signal that triggers the penis to get hard and triggers sexual climax. Serotonin boosts prolactin, which is another brain chemical that can prevent sexual climax as well as decrease testosterone production. Other antidepressants such as tricyclic antidepressants and monoamine inhibitors can have negative effects on sexual function as well. Fortunately, some antidepressants, such as bupropion, nefazodone, and mirtazapine, have many fewer of these side effects. Medications used to treat psychosis and medications used to treat anxiety often work by lowering dopamine levels. Dopamine plays a key role in the brain in stimulating erections. Fortunately, even while on these necessary medications, oral medications such as Viagra can still work.[16]

There are other common psychological causes of erectile dysfunction. A guy may suppress feelings he is unable or unwilling to confront with his partner, including lack of intimacy or lack of feeling desired. On the other hand, he may feel less desire towards his partner due to his partner's physical changes, such as weight gain, or due to a problem the partner may be having with sex. In some cases there may be anxiety over pregnancy, as when one partner wants to have a child but the other doesn't or when the couple is unable to get pregnant. Guilt can also be a significant cause of anxiety that leads to sexual dysfunction. Religious prohibitions, divorce, and death of a spouse can all work at a very deep level on a guy's mind. Professional therapy can help to free him up to enjoy sex without the guilt.[17]

Overexposure to pornography can ruin the real thing. In Chapter 6, we took a deep dive into porno penis and revealed how men who watch pornography excessively—several times a week—are at risk of losing enjoyment of sex in real life. Brain centers that are important to experiencing pleasure and intimacy become desensitized and shrink. These changes mimic those seen

in drug addicts. This used to be a rare problem, but since the advent of smartphones and Internet streaming, porn is literally everywhere, all the time.

In many cases of behavioral/psychological causes of erectile dysfunction, prescription penis pills can help. If it's a matter of a loss of confidence from being unexpectedly off your game, the reliability of a pill-induced erection may allow you to be less anxious. Sometimes a short, deliberate course of these pills will allow you to eventually get back in the saddle without them. In some cases the adrenaline will still overpower the medication. Even in cases that are primarily physical, a psychological component or reaction to the physical problem can throw fuel onto the fire. Working with a behavioral sexual medicine expert can allow medications to work better or lower your need for them.

Routine prescriptions for pills like Viagra or Cialis don't always work for any of these various causes of erectile dysfunction, whether medical or behavioral. The next chapter will explain how the pills do and don't work and discuss additional treatments that work when pills don't, including injections, devices, and surgery. The treatment of low testosterone is often needed as part of the remedy for men with poor erections, and this is covered extensively in Chapter 13. Fortunately, we now live in a time when a man can get effective help for erection problems and no longer be sent home from the doctor's office in quiet desperation.

CHAPTER 10

PENIS PILLS

There really weren't any pills that worked very well for erectile dysfunction when I first started my training as a doctor back in the late 1980s. Yohimbine was the only pill you could prescribe, and it usually didn't work very well, although it raised your blood pressure and made you jittery. Now, that's not very sexy. Most doctors, even urologists, took a "don't ask, don't tell" approach to erectile dysfunction. The options that did work—penis injections, mechanical devices, and surgery—were too complicated for most doctors to deal with.

In the early 1990s, a clinical trial was conducted for a new medication to treat angina, the chest pain that happens when there is an abnormally poor flow of blood to the heart. The results were lousy and the clinical trial was stopped since it was clear this drug would not succeed and further study would just lose money for the company. But a funny thing happened when the trial was stopped: The patients revolted! Unbeknownst to many of the doctors in the study, the patients were experiencing a very nice side effect—better erections. Many of the patients in the clinical trials had erection problems to begin with because, after all, they had cardiovascular disease, a common cause of weak erections. Once the scientists took notice of this interesting "side effect," they had the good sense to switch gears, forget about the heart, and play to their strength. Thus was born Viagra, and the rest is history.

Sildenafil, the chemical name for Viagra, works by playing defense for your erection. You may not realize it, but your penis has a built-in cock-blocker. It is a chemical reaction that occurs naturally to make sure that an erection eventually goes down, and for good reason. During an erection, a chemical reaction

increases the amount of nitric oxide (NO) in the blood vessels, making them relax and open wide to allow the blood to rush into the penis and cause an erection. Once the penis becomes erect, the bloodflow slows to a crawl because it is trapped, sort of like in a traffic jam. If this goes on too long, the blood runs out of oxygen, and the penile tissues will get injured. To avoid this, the penis releases a special chemical into the blood called *phosphodiesterase type 5* that puts the brakes on NO. This is the cock-blocker. It causes the arteries to squeeze closed and divert the "traffic" away from the traffic jam, letting the old blood drain out and fresh oxygen-rich blood flow in. Rush hour is over! (Okay, not exactly "hour"—more like 5 to 7 minutes, for most of us.)

This phosphodiesterase type 5 safety mechanism is great when you are young, healthy, and your "dick gets hard when the wind blows" to quote Eddie Murphy in *48 Hours.* But it's a problem when your arteries are narrowed and there's not even enough blood entering the penis to cause the "traffic jam." All the prescription penis pills work by blocking the cock-blocker: They shut down phosphodiesterase type 5. This lets more NO build up in the blood vessels and lets more and more blood flow in for a longer amount of time so you can get back to jammin.' Although all the pills work for the same reason, they differ from one another in how long they take to work, how long they last, and their side effects. Cialis, also known as tadalafil, was another medicine being tested as a heart pill when the whole Viagra discovery hit. The scientists working on tadalafil didn't have to be told twice and quickly got their drug patented for the penis. Cialis has the unique advantage of being effective for a day and a half. Viagra, on the other hand, is effective for about 4 hours. Four hours is plenty, but things come up and schedules change. A 36-hour pill can give you more "wiggle room," as it were. Because Cialis lasts so long, it can be taken as a low dose once a day, with the level in your body getting higher and higher over the first 5 days, then settling out to be the same as if you took a full dose on purpose. This allows your scout to always "be prepared." It also turns out that this low daily dosing helps with urination symptoms due to an enlarged prostate such as a weak flow, frequent urination, and waking up at night to urinate. Staxyn (vardenafil) dissolves on the tongue. Perhaps designed for more

“discreet” use, it may work a little faster due to direct absorption in the mouth.

On the other hand, the different pills can have different side effects. The side effects are always temporary and affect only a small percentage of guys. Cialis also blocks another phosphodiesterase, which can result in back pain or muscle aches in some men. Viagra blocks another phosphodiesterase as well, sometimes resulting in temporary visual changes, making things look blue—like the pill. Stendra (avanafil) has the least effect on other phosphodiesterases and causes the fewest side effects. Side effects more or less common to all the pills include headache, runny nose, and indigestion, which are mainly the result of blood vessel relaxation and increased bloodflow in these other parts of the body.[1]

Table 1: Head-to-Head Comparison of Erectile Dysfunction Drugs

DRUG	CHEMICALNA	DOSE	ONSET ANDDURATIC	SIDE EFFECTS
Viagra	Sildenafil	25, 50, 100 mg	Starts working in 30 minutes to 1 hour. Effective for about 4 hours. Better on an empty stomach.	Headache, flushing, indigestion, nasal congestion, altered vision, palpitations
Cialis	Tadalafil	2.5 or 5 mg for daily dosing 10 to 20 mg for on-demand dosing	On-demand dosing starts working in up to 2 hours and is effective for about 36 hours. Daily dosing works in up to 5 days, then is always in effect. Helps urinary symptoms.	Headache, indigestion, nasal congestion, muscle/back aches

Levitra Staxyn	Vardenafil	10, 15, 20 mg	Levitra works in 30 minutes. Staxyn may work faster—it dissolves on the tongue. Effective for about 6 hours.	Headache, indigestion, nasal congestion, palpitations. Tends to have fewer side effects than Viagra.
Stendra	Avanafil	100, 200 mg	Works in 15 to 30 minutes. Effective for about 6 hours. Better on an empty stomach.	Headache, indigestion, nasal congestion. May have fewer side effects than the others.

Table 1 summarizes the various penis pills.

Which pill is the best? Good question. There have been no "head-to-head" trials. Most urologists have concluded that they all pump up the volume about the same, with the biggest differences being the timing and duration of the erection and the difference in side effects. A guy may find that one pill works better than another, but it can be different for different guys. When it comes down to it, I would have to say most of my patients prefer Cialis, and this has been shown to be the case in a couple of studies that looked at patient preference between Viagra and Cialis.[2, 3]

As these medications become available in their generic forms, the lower pricing will likely determine which ones patients use most.

Safety First

What about the risk? Many people are afraid of these pills. Occasional news stories and depictions in pop culture suggest that they might kill you. So many of my patients tell me their partners won't let them take these pills because they are afraid of them getting a heart attack. The truth of the matter is that there is no significant risk of death or even serious illness from taking any of these pills alone. None of these pills directly poisons the heart. If

a person has a heart that is too fragile to withstand the stress of sex, then he should not take these pills, but that is because of the sex these pills will allow. If you aren't sure, check with your cardiologist.[4] If you have suffered a recent heart attack, you should definitely check with your doctor, but in many cases men can get back in the saddle in as little as a week. When taken alone, these pills rarely change your blood pressure to a meaningful degree. Even in combination with most other medications, they are safe.

There are a few key exceptions. The greatest risk comes if you take any of these pills with nitroglycerine. Nitroglycerine is prescribed to some patients with heart disease to increase bloodflow to the heart, especially if they get chest pain. The *nitro* in *nitroglycerine* means nitrogen, and nitroglycerine increases the NO in the blood vessels to your heart. Because the penis pills prevent the NO from the nitroglycerine from being removed by the phosphodiesterase type 5, too much builds up and the heart's arteries open up so much that they can't squeeze the blood all the way throughout the heart and the heart actually loses oxygen, which can cause sudden death. If you take nitroglycerine or any medications containing nitroglycerine, you should not take any of the penis pills. And if you take penis pills, you should not take nitroglycerine or nitroglycerine-containing medications including recreationally used amyl nitrite, also known as "poppers." Amyl nitrate also increases NO in the blood vessels, just like nitroglycerine does.

Another kind of medication to be cautious with is known as an alpha-blocker. This kind of medication is usually used to treat problems with urination and goes by names such as Flomax (tamsulosin), Uroxatral (alfuzosin), Rapaflow (silodosin), Cardura (doxazosin), and Hytrin (terazosin). The issue with these medications is that they can lower blood pressure when taken with penis pills, but the body will tend to get used to them, so the risk is mainly when a person first starts using them.

An extremely rare side effect of Cialis and Viagra is sudden loss of vision or hearing. This is not only extremely rare but poorly understood. Men with a rare vision disorder called *retinitis pigmentosa* are at greatest risk. There is some debate whether some of the cases are truly linked to these medications. Certain medical conditions such as liver failure and certain medications

can make these penis pills last much longer in your body and aggravate side effects and risks, so these medications should be prescribed by a doctor who understands your total health.

If at First You Don't Succeed…

The ravages of elevated cholesterol, diabetes, high blood pressure, smoking, obesity, poor diet, and lack of exercise can be too much for the penis pills to work. So what's a guy to do? Fortunately, when a pill doesn't work, it's not game over. There are several strategies that can save the day (or the night, as it were). First and foremost is picking yourself up, dusting yourself off (or sponging yourself off perhaps), and trying again. In many cases it takes a few tries before the pills work. This is most likely because there may be some anxiety and therefore adrenaline release associated with taking the pills, and adrenaline can prevent them from working. The more familiar we become with a situation, the less adrenaline we release, so if we give the pill a few tries and become less anxious about the process, we may get the results we want.

Sometimes pills don't work because the person simply needs a higher dose and doesn't know there is one. Oftentimes the samples a guy receives from his doctor are of a lower-than-maximum dose. Many doctors are cautious about dosing these medications even though they are very safe, so they start their patient on a low dose that, for the majority of guys, won't work. Many of these men will go home, try it, and figure that because it didn't work, they aren't fixable. That's a real shame, because if they weren't so nervous and had a proper understanding, in many cases all they would need to do is double up on the dose and try again.

Another issue can be that the dose they are taking isn't getting absorbed properly into the bloodstream. Viagra may not work well if taken on a full stomach after a fatty meal. It's best to take Viagra or the generic, sildenafil, an hour before meals or 2 hours after meals. So if that corn dog or fried turkey leg is calling your name at the state fair, don't make any big plans for the Tunnel of Love soon after. Cialis is not affected by food, but it takes up to 2 hours to kick in. Levitra and Stendra work more quickly and are not affected by food either.

All of the pills are blunted by alcohol. An erection is harder to get and keep when you are intoxicated, especially as you get older. The pills can't always overpower the alcohol. Plus the combination of excess alcohol and a penis pill can cause a serious drop in blood pressure. So, if you pop a Viagra as you are finishing off a nice bottle of wine along with a prime cut of meat, walk don't run from the dining room to the bedroom, because it may be a while before you get your just desserts.

Supplements

In Chapter 5, Bigger Faster Harder: Penis Enhancements, I discussed the various herbal ingredients thought to have some kind of impact on sexual prowess, whether it's increasing hardness, increasing interest, or increasing pleasure. Of these many ingredients, a few have been shown to help men with physical ED, but usually milder cases. For the small percentage of nutritional supplements that have been studied, side effects are typically mild and uncommon, but there are many more supplements out there that haven't been safety tested. Some herbs can be very hard on the liver.

The irony is that many of the supplements available over the counter or online without a prescription are more risky to take than the prescription pills, and they don't even work as well—if at all. To add insult to injury, they often cost as much as or more than the real stuff, especially if the penis pills are covered by insurance. If you need help, don't hesitate to see your doctor and get a prescription for effective medication. If you prefer to stay out of the clinic, choose supplements that have science behind them. Look for products that have been proven to boost NO and that have been studied for safety.

Testosterone

Many men with poor erections also have low testosterone. Boosting testosterone back to normal can completely fix the problem in a small percentage of these men, but for most, it's just part of the fix, albeit a very important part. Low testosterone is discussed extensively in Chapter 13, but it's important to understand how it plays a part in other treatments for poor

erections. Passion's fire can't ignite without the fuel of testosterone sloshing around the brain. Furthermore, the penis itself becomes less supple and stretchy and can't fill and expand as well without testosterone bathing its tissues. Many men with low T have other medical causes of poor bloodflow to the penis that require penis pills to treat. However, in men with low T, the pills often aren't able to work even when the dosage is increased. If testosterone is boosted to normal, many of these men will have much better results with the penis pills. When you restore testosterone, desire can improve right away, but improvements in the penis can take a bit longer, up to months for some.

The advent of pills for erectile dysfunction that actually work has forever changed the way doctors treat ED. These medications are truly medical miracles, and they have changed our society's attitudes and enlightenment about sex and health. Nonetheless, they simply can't work for all men in all situations, and that can be devastating for those men. Fortunately, there are second- and third-line treatments that are very successful even when the pills are not. They are discussed in the next chapter.

CHAPTER 11

NOW WHAT? WHEN PILLS DON'T WORK

Sometimes the only thing more demoralizing than having erectile dysfunction is seeking and then *failing* treatment for erectile dysfunction. It used to be that no one talked about ED, and now it seems that no one will shut up about it. You can't watch TV, especially if it's a sporting event, without being reminded of how good your sex life could be if you just popped a pill. Unfortunately, you will be sitting in that Cialis bathtub a long, lonely time, long after the sun has set, if you are one of the 35 percent of men for whom the pills won't work.[1]

The previous chapter reviewed strategies to make the pills work better, but for many men the underlying problem is too big for the medication to overcome. The blood vessels may be too narrowed, the penis may be too fibrotic, the nerves may be too damaged, or the anxiety may be too great. In some cases the side effects are too much, or the pills may be dangerous because the guy has to take nitroglycerine for his heart. Fortunately, in all of these scenarios, it's not game over, it's just time to step up the game. There are other options that usually work even when the pills cannot. Most have been around longer than the pills, but the pills really allowed men to come out from hiding, so now these other treatments have seen a big revival. These "second-line" treatments include the vacuum erection device, an injection into the penis that stimulates bloodflow, or a suppository or gel for the urethra that stimulates bloodflow. If none of these methods is successful, there is still the highly effective "third-line" treatment of penis implant surgery. So there is no need to give up if the samples don't work. Keep your big head up, because one way or another you can get your little head up.

Why Pills Don't Work

One of the situations where pills do not work is when there has been a significant amount of nerve damage. The pills all work by blocking the breakdown of nitric oxide (NO) in the penis, as NO stimulates more bloodflow. NO mainly comes from nerve endings in the penis. If the signal never reaches the nerve endings, NO will not be released. Without NO, there really isn't any way that the pills can help the erection. The pills are like Hamburger Helper, but in this case, there's no hamburger.

When there is damage to the spine, the signal from the brain can't make it to the penis to release NO. Nerves in the lower spine still can send a signal to release NO in the penis as a reflex to stimulation coming into those nerves from the penis. This signal is weak, but it's enough for the pills to work. On the other hand, if the damage to the spine is below the level of these reflex nerves, then they are cut off from the penis and the pills won't work. If a man has an injury to the pelvis that damages the nerves that end in the penis, then the NO won't get released. These nerves run right between the prostate and the rectum, so surgery or radiation on these parts can cause erection problems that may not be improved with pills.

A Little Prick

Before there was Viagra, when there were no pills that really worked very well, an eccentric English scientist named Professor Giles Brindley was puttering around, experimenting on various drugs that could be injected right into the penis to wake it up. His test subject was Mr. Johnson, as in his own johnson. In the great tradition of mad scientists before him, he thought outside the box (so that others could get back into the box). After trial and error, some bruising, and most likely an exhausted spouse, he presented his findings at the national meeting of the American Urological Association (my homies) in none other than Las Vegas in 1983. This would prove to be the most exciting presentation of the meeting, and some would say the most exciting presentation ever. He had actually injected his own penis in his hotel room prior to his allotted lecture time and arrived at the podium in some loose-fitting clothes—Ron Jeremy casual—in front of an audience of

mainly suits and a few skirts. Midway through his presentation, he stepped out from behind the podium, dropped trou, and revealed his discovery. To really ram home the point, he then circulated amongst the crowd to allow the attendees the opportunity to evaluate "firsthand" how solid his research really was. What happened in Vegas didn't stay in Vegas. From this seminal presentation arose the development and widespread use of injections to treat erectile dysfunction. This became the only reliable medical therapy available until Viagra was developed. Ultimately about seven injectable drugs were identified that have some effect on a penis (mainly Dr. Brindley's penis). Of these, one has been FDA approved for clinical use.

The only FDA-approved penis injection is called *alprostadil*, aka prostaglandin E1 (PGE1). It works by directly stimulating the blood vessels to open up and increase bloodflow into the penis. The nerves don't have to be involved. In fact, the brain doesn't have to be involved. An injection of alprostadil right into the penis can cause an erection even if you have no sexual desire whatsoever. You can be doing your taxes or paying bills and it will still work.

Sometimes the nerves are okay but the blood vessels of the penis are in such poor condition that the increased NO the penis pills allow isn't enough to do the job. The blood vessel lining makes less and less NO just from aging alone. The pills may have worked at one point, but as time passes and blood vessels age and disease progresses, they can stop working. Diabetes causes nerve damage as well as blood vessel disease, and the nerves of the penis in a man with diabetes may simply not release enough NO for the pills to work with, plus the blood vessels may not be able to respond well enough to the increased NO the pills can allow. Diabetics are one of the largest groups of men for whom pills may not work, and in the vast majority, the injections will. Alprostadil can work when pills fail because not only can it cause an increase in NO with or without the nerve endings, but it also triggers other reactions that make the blood vessels open up.

Other injectable medications work in ways very similar to but not exactly the same as alprostadil, and when combined, the effects are even more powerful. One goes by the name of *papaverine*, which is what Dr. Brindley was rocking that fateful day in Vegas. Another is *phentolamine,* which works by blocking

adrenaline-like molecules from squeezing off the bloodflow to the penis. *Atropine* is less commonly used; its effect is basically a double reverse. It decreases a reaction that decreases a reaction that stimulates a reaction that stimulates the blood vessels to open up and allow an erection.[2] (Whew! Try keeping your erection while sorting that one out!) Although it's often prescribed in combination with all three other agents, it has not been proven to add much to the erection. Atropine is more commonly used during cardiac arrest to stimulate the heart.

Alprostadil works in about 70 percent of patients in general and about 90 percent of those who have failed to improve with pills.[3, 4] As the only injectable agent that is FDA approved, alprostadil comes as two brands: Caverject and Edex. These medications are by prescription only. The difference between the two is the injection syringe, but the ingredient is the same. Both are packaged as prefilled syringes with powder and liquid that mix automatically in the syringe just before injection. Generic alprostadil comes as a powder in its own vial with a separate vial of liquid that you must combine yourself before using. The other injectables are not FDA approved but are considered to meet the proper standard of care and therefore widely prescribed by doctors and prepared by compounding pharmacies that have to meet regulatory standards to keep patients safe. They come in combinations of ingredients, such as papaverine and phentolamine, which is called "bimix," or they come premixed along with alprostadil (aka PGE1) or along with alprostadil and atropine in combinations known as "trimix" and "quadmix." These formulas must be kept in the refrigerator between uses and gradually degrade over time. They don't go bad quickly like milk, but 2 months later they will be about 30 percent less potent.[5]

Alprostadil is the most effective of the medications, but it can cause a burn or ache in the shaft of the penis in a small percentage of men. For these men, the alternative bimix doesn't burn as much. Trimix, which includes alprostadil, burns less than alprostadil alone but is more powerful. Because of the papaverine in the trimix, there is a small risk—6 percent—of developing fibrosis in the penis.[6] If a guy develops fibrosis, it is often permanent. If he stops injections for a few months, it may go away.[7] For guys who can't get a satisfactory erection with pills or vacuum devices, the trade-off of risking fibrosis in order to have

erections is usually acceptable.

Regardless of the brand or the combination, the medication is injected in very small amounts—just a fraction of 1 milliliter—through a very small needle into the side of the penis. The needle is about a half inch long and the diameter is about 30 gauge, which is one-fourth of 1 millimeter in thickness. It's hard to even see the needle. The needle is inserted in the side of the penis. And the truth is it really doesn't hurt very much. Trust me, I'm a doctor. Most of the sensitive nerves are in the head of the penis, not the sides of the shaft. You should avoid injecting into the top surface of the penis (side facing upward), where you might pierce one of the larger veins or a surface artery and cause a lot of bleeding and swelling. Also, you could stab the nerve bundles (ouch!) that run along the top side of the shaft toward the head of the penis.

The shaft of the penis is made of two cylindrical chambers, kind of like two pontoons situated side by side. The lining is tough but the inside of the chamber is a soft, spongy matrix of blood vessels. The key is to get the needle tip well inside the chamber so the medication can be circulated throughout the spongy spaces. Fortunately, this is very easy to do. You don't need a professional medical degree to be able to inject your penis, but a doctor or another person with a professional medical degree should teach you how to do it. There is no special vein or artery you have to thread. You simply have to get the needle squarely into your shaft, usually up to the hub. There is even an autoinjector that can make the whole process fairly easy. You only have to inject one side because the blood flows from one chamber to another. The urethra runs along the underside of the shaft of the penis in its own compartment. You should avoid injecting the urethra, otherwise you will cause bleeding and burning with urination—but no erection.

The dose you use will be determined by your prescribing doctor. Typically, your first injection or two will be performed in the doctor's office as a test to help determine what dose you need. When it comes to injecting penises, one size does not fit all. Some men have excellent blood vessels but no nerve signal. They won't need very much of the injection to get an excellent erection. In fact, a very low dose is all that they likely will need. As with any injection, it is important to use sterile technique and

fresh needles and syringes each time.

After the injection, hold pressure on your penis for a couple of minutes, and you should expect an erection within 10 to 20 minutes. Depending on how you respond, the erection will last a varying length of time. The goal is to achieve an erection that can last 30 minutes to an hour. This is much longer than most couples ever last, but it allows time for getting back into bed. There's even time to put on the Barry White, light a few candles, and break out the can of whipped cream—or the whips, depending on the mood.

If the dose isn't strong enough, you can inject more the next time, but wait another day because if you inject more on the same day, the response becomes less predictable and you may develop an erection that lasts too long. This is a dangerous condition because the longer an erection lasts, the less oxygen there is for the penis, to the point where there can be permanent damage. The injections have a much greater range of potencies than pills. They can be made stronger not only by injecting more volume but also by making the solution itself more concentrated. As a rule of thumb, younger men will not require as strong a formula as older men, and men with longstanding diabetes will tend to require higher concentrations. Because the dosing is definitely not one size fits all, try to get the dose worked out on your own or with a partner with whom you are very comfortable before you put yourself on the spot in a high-stakes situation such as a special occasion, long-awaited vacation, or tryst with a new love.

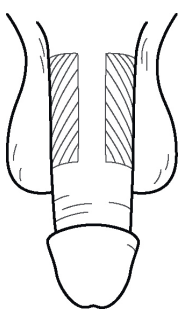


Figure 1 Safe zones for injecting the penis

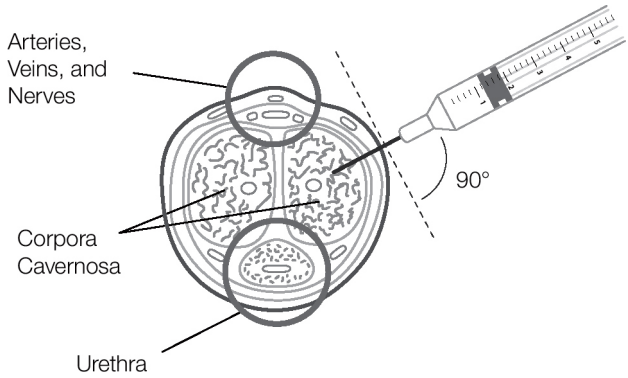


Figure 2 Needle placement for injecting the penis

Too Much of a Good Thing

If the dose is too strong, the erection will last too long, which is a condition known as *priapism*. You may have heard the warning in the commercials for penis pills to "contact your doctor if an erection lasts more than 4 hours." And you may have even thought that was just subliminal marketing to make you want to try them. In reality, I almost never see that happen with the pills. On the other hand, the injections are so much more powerful than the pills that I *do* see that happen with the injections much more often. So what do you do if an erection lasts more than 4 hours? One of my patients told me he would call all his friends! But honestly, by the 4th hour, it's not so fun anymore. A 4-hour erection is not a healthy situation for your penis because the blood is trapped in the erection and, over time, the penis becomes starved for oxygen. Ever try to hold your breath too long? It hurts, and so does your penis as the hours go by. As if that weren't bad enough, the tissues of the penis will start to die and eventually get replaced with fibrotic tissue, which cannot become erect normally.

If you get an erection that lasts longer than a couple hours, you need to start taking evasive maneuvers. The first maneuver is to try to climax. When you climax, you release a lot of adrenaline-type molecules into your bloodstream (so intense!) and the adrenaline shunts your blood away from your smaller parts, like your fingers, toes, and penis, diverting it to the essential organs of the lungs, heart, and brain. This is why you

lose your erection after you ejaculate. It's normal. But an injection of medication in the penis is more than "normal," so the adrenaline release from ejaculation may not be sufficient.

Another way to pump up the adrenaline is with exercise. Hit the treadmill or climb some stairs, but try not to put anyone's eye out with that thing!

If the clock is running and you are still hard, you can take medication that mimics adrenaline to try to squeeze closed the blood vessels to the penis. If you find yourself hard up after ejaculating, or you just can't get there, drive over to the drugstore and pick up some Sudafed (psuedo-ephedrine—not Sudafed PE) over the counter. It has adrenaline-like properties. Get the immediate-release 60-milligram version and take two. Another over-the-counter countermeasure is Neo-Synephrine nasal spray. A couple of squirts up the nose gets phenylephrine, a very potent adrenaline-like molecule, into your bloodstream and on its way to your penis. Terbutaline is a prescription medication that works in many cases as an alternative to Sudafed. You take 5 milligrams and give it 15 minutes; if you are still running around more than half-cocked, you take another 5 milligrams. If one or another of these medications doesn't work, call your doctor and head on in to the emergency room or to the office for an antidote injection. The injection actually contains the same ingredient as Neo-Synephrine (generic name: phenylephrine), but it is injected right into the penis, where it's much more concentrated than the dilute stuff arriving from way up in your nose. Normally, injected phenylephrine is used to increase blood pressure in a severely ill person in an emergency situation, so when it's injected into a healthy person with a hard-on, it has to be done with great care, often with blood pressure monitoring and slow, gradual doses. If you are very sensitive to a penis injection, and you develop priapism, the doctor will instruct you to give it a rest and then try again with a lower dose. If you still have a recurring problem despite trying to use very low doses, your doctor may actually prescribe some prefilled syringes of dilute Neo-Synephrine to use at home. If so, follow the instructions carefully.

An important advantage the injections have over the pills, besides being more powerful, is that they present fewer risks to the body as a whole. The pills have very little risk as it is, but they cannot be taken with nitroglycerine or nitroglycerine-

containing medications. The injections only affect the penis—the site where they are injected—and their effects are diluted in the rest of the body, so men who take nitroglycerine can use the injections to restore their love life without risking their *whole* life. Of course, if you have a serious heart condition, check with your cardiologist that the exertion of sex alone does not overstrain your heart.

There are a few instances in which the injections should not be used, as for patients who are at high risk of getting priapism—a prolonged erection—due to an underlying medical condition. Patients with sickle cell anemia, leukemia, and multiple myeloma are at risk because their blood is sludgy with abnormal cells due to their condition, and the sludgy blood may not flow out of the erect penis as easily, causing it to be trapped and leading to a prolonged, painful erection that can be harder to treat than just your run-of-the-mill priapism. Also, men with Peyronie's disease (a condition where there is already fibrosis in the penis) should consider avoiding these injections due to the added risk of more fibrosis. If a man is on blood thinners, he can still use the injections because the needle is so small. Nonetheless, he should hold pressure after the injection for about 5 minutes.

In Through the Out Hole

Remember when you were a kid and you had to go to the doctor to get a shot and you would get a lollipop or a sticker? Well, your reward for a shot in the penis is a whole lot better, but even so, not everyone can handle the idea of a needle in the dick. There is an alternative called MUSE and it is an FDA-approved medication. MUSE is alprostadil, the same master ingredient in the injections, but it is formulated to be put into the pee hole and be absorbed by the lining of the urethra. That's not to say that sticking something up your urethra is a pleasant thought, but for many men it's more acceptable than the needle. The medication comes as a pellet that's smaller than a rice grain and it's preloaded in a little plunger that fits easily up the urethra for a short distance. Once you push it in you squish your penis a bit to smash the pellet up so it can be absorbed (I favor the fire-starter maneuver where you roll the penis back and forth between your hands like you're trying to spark a campfire with a stick). MUSE

is typically stronger than pills but not as strong as injections. Because it has to be absorbed in the urethra, it makes it into the critical chambers of the penis less directly and so it's not as potent. Higher doses must be used to get the same or lesser effect. Whereas the maximum dose of Caverject is 40 micrograms of alprostadil, the maximum dose of MUSE is 1,000 micrograms. About 40 to 50 percent of men will get a good response with MUSE. Also, MUSE can be combined with pills to get an extra oomph out of both. Because the alprostadil gets absorbed into the bloodstream at higher doses, there is up to a 6 percent risk of a drop in blood pressure, dizziness, or even passing out.[8]

Okay, no needles sounds good, but can we please just not stick *anything* in there? Topical formulas with alprostadil and some other agents have been tried, but so far they are not very effective. It's really hit or miss with these products, and it's more often miss.

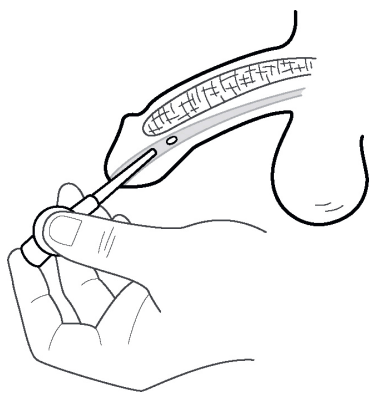


Figure 3 Suppository for the urethra

This Sucks!

There is an alternative treatment to pills and injections and urethral suppositories, and it sucks—literally. It's the vacuum erection device (VED), commonly referred to as the "penis pump." Featured prominently in the Austin Powers comedies ("That's my bag, baby!"), it's no joke. It actually is a very safe and effective alternative and has been around longer than any of the other remedies.

It's a simple device. A transparent plastic cylinder is placed

over the penis. The tube has a device at the far end to pump air out, creating a vacuum in the cylinder. This causes the blood to rush into your penis as your penis expands, trying to fill the vacuum. Voilà! An erection. It doesn't matter if the proper nerves are sending signals or if the arteries are stimulated—this is a complete override. If pills don't work, and even if shots don't work, the vacuum erection device can still work. Once the penis is maximally erect, an elastic constriction band is slipped off the near end of the cylinder onto the base of the penis in order to prevent the drainage of blood out of the erection. The constriction band, which is essentially a silicone cock ring, can stay in place safely only for up to 30 minutes—so don't waste time checking your email or watching TV. After 30 minutes, the tissues need some oxygen. One of the advantages of the penis pump is that it's a reusable device so there are no recurring costs. You only have to pay to play one time, and after that it's free. (Well, let's face it, is it ever really free?) You just rinse and repeat.

Vacuum devices have evolved over the years. The first use of a vacuum cylinder was in the late 1800s but there was no constriction band, so your erection was fun to look at but not very useful.[9] Kind of like a snow globe, but with a penis in it. Hollywood came to the rescue and a silent film star, Otto Lederer, patented the use of added constriction bands.[10] The system wasn't really perfected until the early 1980s, when the FDA approved the Osbon ErecAid.[11] The current models have safety valves to prevent the suction from getting too strong and overstretching you. Until recently, FDA-approved penis pumps could be prescribed and be paid for by Medicare and some insurances; however, Medicare no longer covers these devices. There are many brands at a wide range of prices, from under $100 to over $400. They can be found on pornographic Web sites or in pharmacies, but they no longer require a prescription. It is best to keep with an FDA-approved model because of the pressure pop-off safety mechanism. Depending on how much you want to spend (it's your penis, don't cheap out), you can obtain a model with a battery-powered vacuum pump or just a hand-squeezed pump. The electric models are good for men with arthritis as well.

These pumps are very effective for many men, but not all. The

reported success rates range widely, from 30 percent to 90 percent.[12] Although many men are put off by the mechanical nature of the device, it's only required for a few minutes and then it's out of sight. Of course, an understanding and cooperative partner makes all the difference. The device is mechanical in nature so it may require some adjustments when you are first starting to use it. It may not be as simple as plug and play. The most important tweak is ensuring a good seal for the vacuum to form. Lubricant and firm pressure help make the seal. Some pumps come with a rubber dam that fits around the base to help with the seal. Shaving the hair at the base of the penis may help too. Constriction bands are not one size fits all, and some men may require a tighter band than others not just due to size but also due to the amount of compression their tissue requires to hold the blood in the penis.

The main medical reason for failure is an inability to effectively keep the blood trapped in the erection by the constriction band. In some cases the tissues of the penis just won't compress effectively enough. In other cases the band is too painful at the tightness required for it to work. The nature of the erection is different than a natural erection because the constriction band makes the penis harder from that point on, but the root of the penis is less hard and so there may be a "hinge" effect at that point. This may cause the penis to pivot or angulate. For some it may make insertion more awkward. Again, a willing and understanding partner is key. Because the device is purely mechanical, there are no drug side effects nor interactions with other medications. Still, as with the injections, use caution with conditions like sickle cell anemia or leukemia where the blood can be sludgy and an erection more difficult to reverse. The side effects that can occur due to the vacuum suction include bruising or petechia (small reddish spots on the skin, like microbruises) or edema (swelling of the skin). The constriction band can cause temporary symptoms of less sensation in the penis, a bluish appearance of the skin due to congestion of blood in the veins, or some discomfort with ejaculation due to compression of the urethra. Some bands are designed to compress the urethra less.

Even if it's not effective as a "stand-alone" treatment, the penis pump can be used in combination with pills, shots, and urethral suppositories. Think of it as a kick-starter. Ultimately, it

may not be effective or satisfactory for sex, even in combination, but it is still potentially useful for "penis rehab." The penis can be a use-it-or-lose-it organ. Just as your muscles stay toned with regular athletic activity, your penis stays expandable with regular filling and stretching. If your erectile dysfunction has left you going for long periods of time without erections, the spongy tissue of your penis that expands with blood will lose its flexibility, smooth muscle cells that line the blood vessels will die off and be replaced by stiffer collagen, and the penis will contract and shorten, leaving you higher and drier. This damage occurs even more quickly when ED is due to a loss of nerve stimulation such as can happen with prostate cancer surgery or radiation. Under normal circumstances, Mr. Happy gets hard and happier several times over the course of a day and night. Even if you don't recall getting an erection today, and even if you are a celibate monk living in a cave in the mountains, you still have erections several times a night while you are asleep. Your body does this automatically, whether or not you are dreaming and whether or not you are dreaming about your penis. If you have significant erectile dysfunction due to an underlying medical condition, as opposed to a behavioral or psychological cause, your body will not be able to cause the erections properly, and then the tissues will wither on the vine. The vacuum device can be used to give your penis a "flush." Using the penis pump for 5 or 10 minutes a day, without the constriction band, expands the penis tissues, circulating more blood through them. It's like a personal trainer for the penis. It's also possible that this boost in circulation helps boost natural production of NO and other molecules within the tissues, which helps prevent cell death and fibrosis and rejuvenates the tissues at a molecular level.[13] Men who have lost length can regain some or all of it over weeks to months of daily use.[14] Size enhancement does not occur to any meaningful degree for men with healthy, normal erections.[15] (For more about size enhancement, see Chapter 5.)

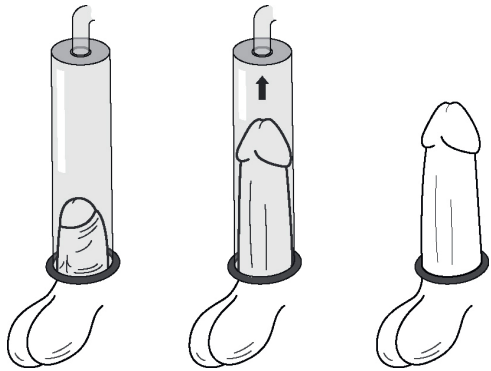


Figure 4 Vacuum erection device

Prostate Surgery Rehab

A lot of attention has been given to treatment of erectile dysfunction caused by prostate surgery. Prostate cancer is the most common cancer in men, and it's the number two cause of cancer death in men after lung cancer. Fortunately, it can be detected early and cured in most cases, but the cure, which is surgical removal of the prostate or radiation of the prostate, often damages the nerves that switch on the bloodflow into the penis during an erection. This is because these nerves run right next to the prostate so they get injured a little or a lot during surgery and often during radiation. Even if the surgeon is performing an operation specifically designed to "spare the nerve," the nerves still have to be moved out of the way, which will usually affect them, even if only temporarily. When the nerve signals are stopped, the flow of blood for erections stops, even at night when the man is asleep, so there can be a fairly rapid deterioration in the penis tissues and an accelerated case of use it or lose it. The nerves may recover quickly, or they may take up to a year or even two. In the meantime, it has been shown that "penile rehab" can help reduce shrinkage and speed the return of erections.

Penile rehab has been attempted with pills, injections of alprostadil alone or in combination with other agents, or the vacuum constriction device. These treatments have been tried alone and in various combinations. Penis pills are prescribed to be taken every day following surgery for up to a year. The pills can allow for sex if there is enough of the nerve functioning to

allow enough NO to be released for the pills to work on. Even if the effect of the pills is not good enough for sex, there may still be some increased circulation—a stuffie—and therefore some benefit to the tissues in the penis. This will be true at night as well, when the guy is sleeping and the body is trying to stimulate erections. The longer the pill is active in the system, the better, and so daily Cialis has become the most popular choice because its effect lasts for more than 24 hours, whereas the other penis pills last for about 4 to 8 hours. These shorter-acting pills would typically be used in the evening to maximize nocturnal erections.

Prescription penis injections such as alprostadil or the various combinations like bimix or trimix are used for rehab as well, and are often more successful for full erections and sexual function while also serving the purpose of preventive maintenance. In fact, the return to erections without medication is better when injections are used versus pills.[16] With this approach, the guy gives himself an injection in the penis 3 to 4 days a week on alternating days whether or not he is having sex. The dose he uses at home is prescribed by the doctor after a test dose in the office. Studies show the injections to be about twice as effective as pills alone, but of course, they're not as easy as just taking pills.[17] Penis shots aren't for everyone, and the urethral suppository can be used for rehab, but it's not as potent as the injections; however, as with all the treatments it can be combined with the pills for added effect.[18] The vacuum device can also be used daily for rehab. It's applied at home for about 10 minutes a day or more with the goal of pumping up and expanding the penis whether or not the guy has sex, so the constriction band is not used when you are just getting "pumped up." The penis pump always improves the results of penis rehab when used in combination with pills or injections, and it is the most effective way to prevent shrinkage. In fact, the earlier it's used, the better the chance to prevent or reverse shrinkage.[19]

Erectile dysfunction doesn't have to ruin your sex life, and one way or another it can be treated. The injections usually work when the pills don't, and they tend to be less expensive per dose. The vacuum device can work even when the pills and the injections don't, but even so, it doesn't always work for all men. Fortunately, there is still more that can be offered, and for some men, the very best option is surgery. We will explore this option

further in the next chapter.

CHAPTER 12

PUMP IT UP! Surgical Implants for Erectile Dysfunction

"Nothing is certain except death and taxes…and erections if you really want them." So said a urology colleague to me years ago. Most guys want to take a pill to fix a problem. Shots and vacuum pumps are not necessarily first-line treatments, but they often work when pills fail. Even so, they don't work for everyone. That's where surgery comes in. Known as third-line therapy, it's the end of the line when it comes to treatment options, but it's also the beginning of sex again for men who need it and can, in fact, give them a great deal of satisfaction.

The most commonly performed surgery to restore erections is a penile implant. This is a replacement for the blood-filling chambers of the penis. Other less commonly performed surgeries or procedures are intended to repair, bypass, or stretch open the actual blood vessels entering those chambers. Because of the very small caliber of the blood vessels and because so often the problem is not just limited to those blood vessels but is within the chambers themselves, these other operations are less successful, not routinely practiced, and best reserved for the very specific types of problems for which they work best.

Penile Implant Surgery

The earliest recorded penile implant surgery was performed by a German surgeon, Dr. Bogaras, to repair a severe battle injury in the 1930s. He used rib cartilage because he took notice that many animals, including monkeys and dogs, have bones in their penises. In 1944, Dr. Frumkin used a rib surrounded by some abdominal skin as an implant in a patient with erectile

dysfunction.[1] A variety of implanted artificial materials were experimented with over the years. Today we use crafted metal coated with silicone. These implants are referred to as "semi-rigid" because they are designed to have a flexible but firm section that can be bent up or down, depending on how you roll. Up is for "sport suspension" (sex) and down is for "comfort suspension" (tucked out of the way). These are safe, reliable, and simple implants that work very well.[2]

In 1973, down in Texas (where everything is bigger), Dr. Brantley Scott of Baylor University introduced the world to a multi-component system that can mimic the hardness of an erection and the softness of a flaccid penis. This is a more natural experience for the man as opposed to the semirigid implant, which is always firm, one way or the other. Known as an "inflatable" penile prosthesis (implant), it has become the standard of care for most men needing surgery. Refinements and technological advances over the years have led to a device that is reliable, safe, and straightforward to place, making it accessible to men far and wide (and deep). The implant has three specialized components. The first component is the cylinders that are implanted into the penis. Penises come in varying lengths, and so do these cylinders. They are designed to be the approximate shape and size of the chambers in the penis that fill up with blood. These, however, don't fill up with blood; instead, they fill up with sterile water. That water is stored in a small reservoir or container that is tucked away under the lower abdominal muscles, near the bladder. The water gets pumped into and out of these cylinders by a small mechanism that is placed in the scrotum between the two testicles like a third ball. All the components are connected to each other by thin tubing. These ingenious implants not only provide excellent erections, but they also provide a more natural "resting" state of the penis when it's not working hard.

A penile prosthesis (implant) is a wonderful treatment for men who need it, but it's not for everyone. Because the penile implant cylinders are placed inside the penis's natural chambers, the tiny, spongy blood vessels inside those chambers that normally would fill with blood are permanently damaged, so if the implant were to be removed, that tissue would never work again. Therefore, the implant surgery is a permanent step. There is no going back

and trying pills or shots or even the vacuum. This is why the surgery is considered third-line treatment. Before having penile implant surgery, most men will be encouraged to try the first-line options of pills up to maximal doses and the second-line options of penis self-injection or vacuum constriction device (the penis pump). For most men who choose surgery, none of these options works. For some, the side effects are prohibitive, and for a few, the nature of the second-line treatments is distressing and simply unacceptable.

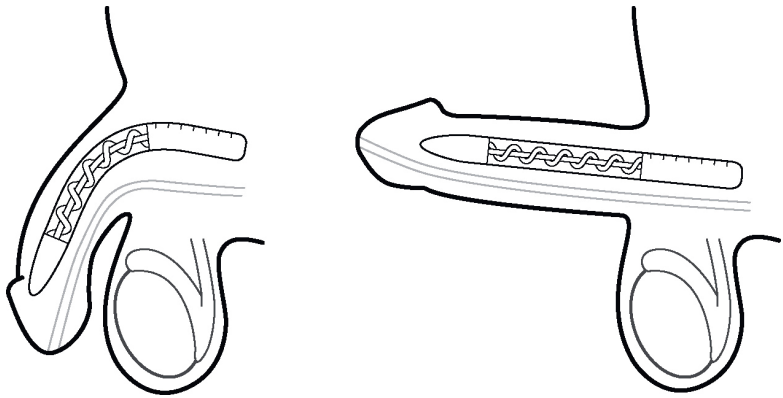


Figure 1 Semirigid penis implant

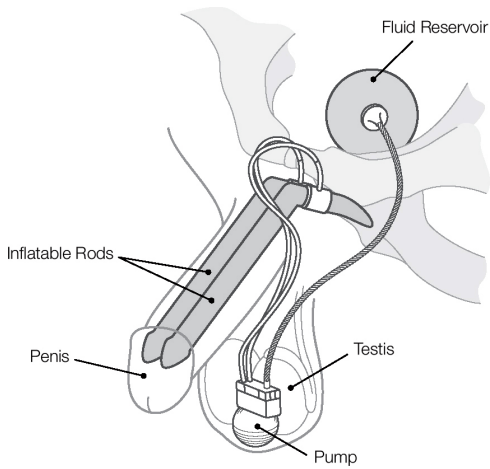


Figure 2 Inflatable penile implant

Better but Not Bigger

Unlike a breast augmentation, a penile prosthesis is not for cosmetic purposes, but rather to restore a function. Breast implants do not restore the function of the breast, which is to produce milk. Penis implants *do* restore the function of the penis, which along with urinating is to become erect so as to allow sexual activity and, if desired, insemination and reproduction. A penis implant allows all of that to happen. A penis implant does not, however, make the penis any bigger. Let me repeat that: A penis implant does not make the penis bigger. You may be wondering why not, since breast augmentation certainly makes breasts bigger. The reason is that the tissues inside the penis will stretch and enlarge only to a point, and then no further. The tissues surrounding the breast glands are fat and skin. These can stretch out *a lot* and more and more over time. Women can receive larger implants and then a period of time later "upgrade" if they so choose. The part of the penile implant that gets the penis hard and straight is inserted within the chambers of the penis that fill with blood. The chambers, known as the *corpus cavernosa*, are made of a very flexible but very strong tissue known as *tunica albuginia*. It's stretchy, but only to a point, and cannot be overstretched like the skin of the breast. In fact, a penile implant must fit *inside* this chamber, and therefore the erection is just a little smaller than the natural one. Furthermore, the implant goes in the shaft of the penis only. The head of the penis cannot be implanted, so it does not get bigger when the implant is pumped up.

Getting a penile implant is a big step, and it's important to go into the operation with realistic expectations. The best way to estimate the size of the penis after an implant is to hold the head of the penis and stretch it straight out as far as you can away from you. Now look down. That's how long it will be, give or take a few millimeters. The stretched penis is a good approximation of the erect penis size. If you have a gut, it will hide part or all of your penis as you look down at it. If you lose your gut, your penis will look bigger. As you age, gravity pulls your looser parts—skin and fat—ever downward, so even without a gut your penis may be partially hidden behind some skin and fat that used to be above it—sort of like a mudslide, but I call it a "man slide." This makes your penis look shorter as well. Again, keep in mind the operation is not cosmetic but is to restore function.

Penis Prehab

Many men who have implants suffer from some actual shrinkage of the penis due to the poor bloodflow over time. These men can feel like they are getting shortchanged since only now are they getting the treatment that works, and it may seem like too little too late. Fortunately, there is a way to restore some or most of the lost length—"penis prehab." As described in a previous chapter, the vacuum constriction device, aka penis pump, is a cylinder that goes over the penis and forces an erection by creating a vacuum around the penis. This can be done for several minutes a day for several weeks to increase the bloodflow into the penis and stretch and expand it back closer to its old shape before the day of surgery. Improvement in lengthening averages more than 3.5 centimeters over a 2-month period. The other benefits of this stretching prehab are that it often makes the tissues of the penis easier to work with during surgery and may make recovery less painful as well.[3]

Troubleshooting

Before performing a surgical implant, the urologist will make sure there are no looming problems with your bladder, prostate, or urethra. If you have problems with your urinary tract that result in infections or the need for surgery, that can lead to complications with the implant. The urologist may take a look at the urinary passageway with a special fiber-optic scope to make sure all is well. No specific testing of the penis itself is required prior to penile implant surgery, but in many cases a duplex/Doppler ultrasound of the penis may be performed to validate that there is a problem with bloodflow. The ultrasound measures the flow of blood into the penis after it is injected with alprostadil or trimix. The Doppler sensor can detect how well the blood is rushing in and how well it is being trapped.

Inflatable versus Semirigid Implants

An important consideration is whether to have a semirigid implant or an inflatable penile prosthesis. The semirigid device is simpler, but it is less "natural." The girth of the penis will be

slightly smaller than with the inflated prosthesis, but the rigidity will be excellent. The biggest drawback is that it cannot be deflated, but it can be positioned downward, out of the way. The advantage to its simplicity is that it is easier to use because no pumping of water is required. The pumping mechanism in an inflatable penile prosthesis can be challenging to manipulate for men with limited hand function due to paralysis, severe arthritis, or other conditions that limit their strength or dexterity. For these men, and particularly for men with partial or total paralysis, a semirigid implant can be a better choice. For the vast majority of men, the inflatable three-piece prosthesis will be the right choice.

Surgical Technique

Penile implants are performed under general or spinal anesthesia. Most urologists will make an incision just below the base of the penis, right across the scrotum, or just above the penis at the pubic bone. Through that incision they can get access to the chambers of the penis, the scrotum, and behind the abdominal wall. The urologist will make small incisions in the chambers of the penis to allow the implanted cylinders to be placed within them. Before placing the implants, the surgeon will measure how long the cavernosal chambers are with a metal measuring sound. Remember, the chambers project back under the pelvic bones just as far as they project forward. These measurements are used to select the size of the implant cylinder that will be put in because one size does not fit all. A semirigid implant can then be placed and the openings sewn up—game over. For an inflatable penile prosthesis, there are two more steps—placing the reservoir for the water under the abdominal wall and placing the pump mechanism in the scrotum. The erection is tested before all the connections are finalized and everything is stitched closed. Sometimes the surgeon may place a small drain tube that will come out through the skin in the low groin and be attached to a suction bulb. This alleviates any oozing of blood from accumulating, and it will typically be removed a day later. The surgeon usually places a Foley catheter in the urethra to keep the bladder drained for a day too. A gauze wrap is placed around the penis, and a jockstrap with ice is applied.

During surgery, there can be challenges or complications. Real

life is not like a textbook, and no two penises are exactly the same. An experienced surgeon can handle most any situation, but it's good to know the possibilities going into surgery. The placement of the cylinders in the penis requires that a space be made within the natural chambers of the penis. This space is normally filled with spongy blood vessel tissue. The surgeon must smash that tissue out of the way with the metal sound that he passes to measure it, and in most cases, with additional sounds he uses to further flatten out that spongy tissue. During this process the surgeon may hit fibrotic tissue that makes it more difficult to pass the metal sound. This fibrosis may be from previous penis injection therapy or it may be from a condition known as Peyronie's disease, which I will discuss further in Chapter 17. In order to open up the space, he may need to make additional cuts in the lining of the chamber to help get through fibrotic tissue. Sometimes the metal sound or dilator will poke through the wall of the penis chamber. If this happens, it's not a big problem unless it pokes through the urethra. If that happens, there is a significant risk of infection or further urethral injury, so the implant cylinder cannot be placed on that side and the operation has to be postponed for about 3 months while things heal. Another risk during surgery is injury to the bladder, intestine, or blood vessels during the placement of the water reservoir into the abdomen. This risk is greater if there has been previous surgery in the pelvis.

What to Expect after Surgery

Depending on the urologist's discretion, you may go home the same day or the next morning, as long as recovery looks to be uncomplicated. A drain or catheter placed at the time of surgery will need to be removed, typically the next day. You will be instructed to use ice on and off your genitals for the first several days to a week, and typically you can bathe or shower after a couple of days. You will have a prescription for pain medication, but the ice will help a great deal. You will also have a prescription for antibiotics, and it is important that you take those to decrease your risk of infection. You *cannot* have sex right away. First of all, you will be too sore, and more importantly, your body has to heal and the suture lines that hold the

components in place have to strengthen. Furthermore, you run the risk of an infection if your skin incision is not completely healed. Your urologist will let you know when you can have sex, but it's usually 4 to 6 weeks after surgery, with 6 weeks being the most common.

You will typically have a visit with the doctor soon after surgery to make sure you are recovering appropriately, and then again around the time you are allowed to start using your new and improved penis. During that visit you will be taught how to work the pump in your scrotum. A newly implanted pump is a lot like a new baseball glove. It is stiff and hard to bend. It will take a fair amount of pressure to squeeze the pump the first several times, but then it will soften up and become much easier. Learning the location of the pump and feeling for the proper place to squeeze can be awkward as well, but like anything else, practice makes perfect. It will be a good idea for you to pump up the implant at least once a day for the first 3 months because the body will form a capsule around the cylinders during those early months, and if the implant is mostly empty, the capsule will be smaller and may restrict the cylinders from expanding. Also, your penis may hurt more than you expected. It can be very sore the first several days after the implant, but it will get better and better with each passing day, and once you are back in the saddle you will soon forget all about it. The first few times you have sex it may be sore as well, but some ibuprofen or acetaminophen can help with that, and things will quickly improve.

Potential Long-Term Complications

Over time, the mechanical components of the inflatable penile prosthesis can fail. The rate is amazingly low, less than 2 percent per year.[4] The implant may fail to pump up. This can be due to an airlock or a kink in the tubing, a malfunction in the valve, or a leak in the system. If the system leaks, there is no harm done because it's just sterile water that gets reabsorbed by the body. Another issue can be that the cylinders do not fully deflate or reinflate on their own as if the penis once again has a mind of its own. This can be due to an issue with the one-way valves in the system or to how the reservoir ends up positioned, and if it is not actually bothering you, you may be able to just leave it alone.

Over time, the cylinders may erode through the tunica albuginea lining that they were placed inside. If that happens in the midshaft, it may cause an out-pouching of the cylinder under the skin, making the erection appear bent and irregular. If it happens at the tip of the penis, the cylinder may tent up the skin overlying the penis or, even worse, poke all the way through the skin or through the urethra. If it pokes through the urethra, you may notice spots of blood in your underwear or urine, or even spraying of the urine. These complications are more likely if the prosthesis is never deflated or if you have poor sensation and don't sense the warning signs of too much pressure on the penis. Another rare complication is movement of the reservoir out of its proper place and down towards the scrotum, like a hernia. If it's not bothering you, it can be left alone.[5]

Any malfunctions or complications require surgery to fix, and this often means removal and replacement of some or all of the components. A repeat surgery often has a quicker recovery, with less soreness than the initial surgery. Surveys show that the vast majority of patients who have had repeat surgeries did so without hesitation because they are so gratified with how the implant has restored their sexual function.[6]

The most dangerous risk is infection. Infection can start at the time of surgery and take a few weeks to show itself, or it can happen years later. The risk of infection is only about 2 percent,[7] and the signs of infection can be very subtle. There may be some increased pain and tenderness in the penis or scrotum, possibly some redness and warmth, or the skin may thicken and get "stuck" on one of the underlying parts. Often there is no fever or abnormal blood test. In other instances an infection can be very dramatic, with pus draining from the scrotum or urethra and possibly fever and chills. Because the penis implant has no blood vessels within its parts, antibiotics cannot saturate it. Furthermore, the body naturally forms a tough capsule around the implanted parts that is a boundary across which no blood vessel can cross. To add insult to injury, when bacteria infect an implant, they form a defensive film barrier along the surface of the implant called a "biofilm" that protects them even further. So if bacteria are able to reach the implant and set up an infection, there is no way to eliminate the infection with antibiotics and the implant must be removed. In the case of a mild infection, the

symptoms may seem to improve with antibiotics but once treatment is over, they will come back. If the infection is a milder one, a new implant can be put in right away after the infected one is removed, and the tissue is thoroughly rinsed out with antibiotic rinse. If the infection is severe, there is a much higher risk that a replacement at that time will get infected too, so in that case it must be removed and a new one put in later, after healing is complete. When an implant has to be removed and cannot be replaced, the penis can contract and scar down as it's healing and become permanently shorter and narrower. In addition, the replacement implant often is narrower and shorter. In such a case there may be some benefit to using a vacuum pump daily to keep the penis long and strong while it is healing up.[8]

Penile implant surgery is the last line of defense for many men who suffer from erectile dysfunction. In spite of the seriousness of surgery and the possibility of risks, it is a treatment that provides many men and their partners tremendous satisfaction and a return to a healthy, happy love life.

CHAPTER 13

RUNNING ON EMPTY: Low Testosterone

Testosterone is the fuel for a man's engine. It's the primary hormone responsible for all things male. It strengthens your muscles and bones, puts hair on your chest (but not your head), and plays an important role in sexual performance. Testosterone can boost desire and it can cure depression. It can make you stronger, better, faster—then again, it may do nothing of the sort if you don't actually need it. Beware: Many men are lured to seek testosterone when, in fact, they absolutely do not need it. On the other hand, if they need it and don't get it they may suffer from worsening obesity, diabetes, hypertension, heart disease, and ultimately, early death.

Testosterone is made in the testicles and surges during puberty, but as men get older, it can dwindle down. Many men don't realize they are running low because unlike a car's gas tank, there is no "empty" warning light for the T tank. Although you can't help aging and it's certainly better than the alternative, there are a number of things you can do to keep your testosterone from running out too soon. Poor lifestyle choices including overeating, lack of exercise, lack of sleep, abuse of drugs and alcohol, and unmanaged stress can all siphon T out of your tank. There are other causes too that you may not be able to control, including medical conditions and necessary medications. But the good news is there are ways to fill 'er up no matter what the cause.

Unlike most medications, testosterone is not taken as a pill, but there are a variety of simple options from injections to implants to creams. Many supplements claim to boost T but almost never do. Many men get T from friends or trainers, often

with bad consequences. The Internet is filled with "recipes" for guys to follow to self-medicate. Many testosterone clinics have sprouted up with less than fully trained personnel running the show. T should always be prescribed by a doctor who is knowledgeable about it because the consequences of taking it can be very serious, including sterility, erectile dysfunction, blood clots, and even cancer. When properly prescribed and monitored, however, the benefits of T for guys who need it far outweigh the risks.

How to Tell If Your T Is Low

Wouldn't it be great if we had some sort of dashboard for our bodies to let us know when there was trouble brewing? Instead we have to pay close attention to how we feel and look out for telltale signs and symptoms. There are a few key warning signs that you may be running on empty. One of the most common is low libido, which means low sexual desire. This can sneak up on you. You might still be able to have erections, but it doesn't occur to you to use them anymore. Perhaps your partner is starting to complain that the only thing that's getting turned on in the bedroom is the TV. Sexual desire is complicated. Sights, sounds, smells, and touch can all trigger it. So can thoughts and fantasies. But nothing happens if the testosterone is too low. Testosterone turns just another pretty face into a burning object of desire. When it comes to sex, testosterone is lubricant for the brain—without it, the gears of lust come grinding to a halt.

Testosterone works on both "brains." The penis actually needs normal levels of testosterone for erections to work properly. Studies in rats indicate that nerves that carry the signal to the penis shrink in size and drop their signals when T runs low.[1, 2] Studies on rabbits indicate the very chambers that fill up with blood during the erection, known as the *corpora cavernosa*, may become shrunken, stiff, and leaky without normal levels of testosterone as the normal stretchy, smooth muscles that line the blood vessels in the chambers die off and are replaced with fat cells and collagen fibers. Like the rabbits', your fatty can get fatty but not so fat.[3]

Sex isn't all there is to life, but low testosterone also robs you of other important aspects of your life. A very common symptom

of low testosterone is fatigue. This is easy to write off as due to working hard, which so many of us do. All work and no play makes Jack a dull boy, but sometimes it's because Jack doesn't have enough testosterone to be able to play after a full day of work. In the case of low T, you may find yourself dozing off in your easy chair soon after dinner, night after night.

Low T clouds your focus and concentration. You may feel you have just "lost your edge" because you are "tired out from work" or because you are "getting older." The truth may be that your brain is running low on the testosterone it needs to stay sharp and focused. Restoring T may be just what it takes to get back your mental stride, stay focused, and be productive. In some cases, it's more serious than just being on top of your game. Low testosterone can result in clinical depression in some men, and correcting it can part the clouds, eliminating the need for prescription antidepressants for many.

Low T actually makes you weaker. It makes your muscles shrink and makes it harder to lose excess fat—even if you work out. A clue to low T may be diminishing returns at the gym, or unwanted weight gain despite dieting. Seventy percent of men with low T are obese.[4]

Your bones get weak too, but you may not notice that until it's too late—or you start losing height as your spine compresses. Your skin can also get weaker, becoming dry and flaky, and you might start to lose body hair. Even your immune system may get weaker.

Low T increases your risk of diabetes, bad (LDL) cholesterol, high blood pressure, and heart disease. This deadly combination is now known as "metabolic syndrome." You can throw obesity into the mix too: At least half of men with diabetes have low T, and having low T doubles your risk of getting diabetes. The lower your T, the higher your blood pressure and the worse your bad cholesterol tends to be.[5]

You may not have any symptoms until it's too late and you are stricken with a heart attack or stroke. If left untreated, low T results in a shorter life span. You don't want your first clue that you have low T to be your *last* clue, so if any of these signs or symptoms is ringing a bell, get checked out.

Going to the doctor with these various complaints can be embarrassing for you and overwhelming for her, so a handy

survey was put together that boils all the moaning and groaning down into a score that alerts the doctor as to whether further testing is in order. The survey is cleverly named ADAM, which stands for Androgen Deficiency in the Aging Male (see Table 1).

A positive questionnaire result is defined as a "yes" answer to questions 1 or 7 or any three other questions.[6] This cues the doctor to consider ordering some blood tests to check your testosterone levels.

Even the blood tests for testosterone are tricky because testosterone can be measured in different ways by different labs, and they don't all match up with each other. It's like having different referees, each with different rulebooks, ruling on the same play. Fortunately, the results are close enough in most situations. In some cases, your testosterone number may be in the normal range, but it's not working normally in your body. This can happen because a lot of the testosterone floating around your bloodstream is actually stuck on protein molecules, where it can't do anything for you. If there are too many of these proteins, the "normal" level of testosterone will actually be too low, and you will suffer the consequences. There are ways to measure these proteins, called *sex hormone binding globulin (SHBG)* and *albumin*, and then calculate the amount of "free" testosterone floating around in your blood to determine if you are okay or not. Sometimes even if your total T number is a little low, if the amount of SHBG is low too, then you may be doing just fine with the amount of T that's floating around free in your blood.

Table 1: Androgen Deficiency in the Aging Male Screening Questionnaire

1. ***Do you have a decrease in libido (sex drive)?***
2. **Do you have a lack of energy?**
3. **Do you have a decrease in strength and/or endurance?**
4. **Have you lost height?**
5. **Have you noticed a decrease in "enjoyment of life"?**
6. **Are you sad and/or grumpy?**
7. ***Are your erections less strong?***
8. **Have you noted a recent deterioration in your ability to play sports?**
9. **Are you falling asleep after dinner?**

10. Has there been a recent deterioration in your work performance?

Even if you account for the types of testosterone and the types of tests, your body will make more or less testosterone depending on the time of day. You tend to make more in the morning because the pituitary gland sends out more LH (luteinizing hormone) signals in the morning, but this can vary, so at least 25 percent of men with low T in one blood test will have normal T in another.[7] Most experts recommend checking at least twice, and maybe three times, and always in the morning.

So what is a normal level? Good question. This has been the subject of a lot of debate amongst experts. Probably the best rule of thumb is if your total T is less than 200 nanograms per deciliter (ng/dl) and you have signs or symptoms, then you are too low. Normal T ranges from 400 to 1,000 ng/dl, and it will tend to be higher in young guys and lower in middle-aged men. This is not an absolute, and there are plenty of younger guys with T levels below 400 who are completely normal, so symptoms are key. The real fun comes when a guy's level is between 200 and 400 ng/dl—now what? Many experts feel that being above 300 ng/dl is the real cutoff for normal, and as long as there are no symptoms, there's usually no problem. On the other hand, we can do a deeper dive and check the free testosterone. If the free T is normal and the guy doesn't have symptoms, he is doing just fine. In other cases, T is in the gray zone and the guy does have some symptoms. Then, the best next test is actually having him try testosterone and seeing if he gets better or not. These numbers all have to be taken in the context of the bigger picture of overall health and medical history. I have seen countless guys who were convinced their T must be low when it was in fact normal or even high, and I have seen just as many who have no problem whatsoever with T levels in the gray zone.

Low T can almost always be treated, but it's important to know why you have it to decide the best treatment. Quick lesson on how testosterone is made: The testicles have special cells, called Leydig cells, that make testosterone. There are a limited number of these cells in the testicles. Leydig cells get turned on and off by signals from the brain, specifically from the pituitary gland. This gland releases a hormone called luteinizing hormone

or LH (mentioned earlier), which stimulates the Leydig cells to make testosterone. The testosterone then gets into the circulation and eventually flows back to the pituitary gland. The pituitary gland will keep pumping out LH to try to crank up testosterone production until a "normal" amount starts floating by it. The pituitary is like the annoying child in the backseat of the car on a long road trip asking "Are we there yet?" Once the level of T in the circulation reaches "normal," the pituitary stops pumping out as much of the LH signal.

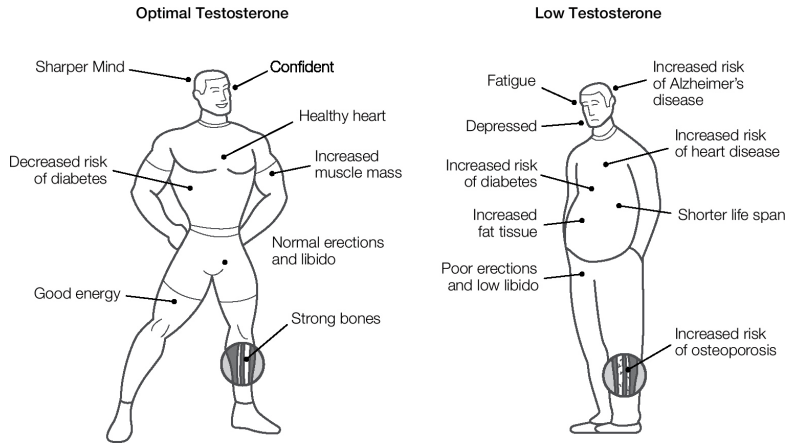


Figure 1 Effects of testosterone on a man's body

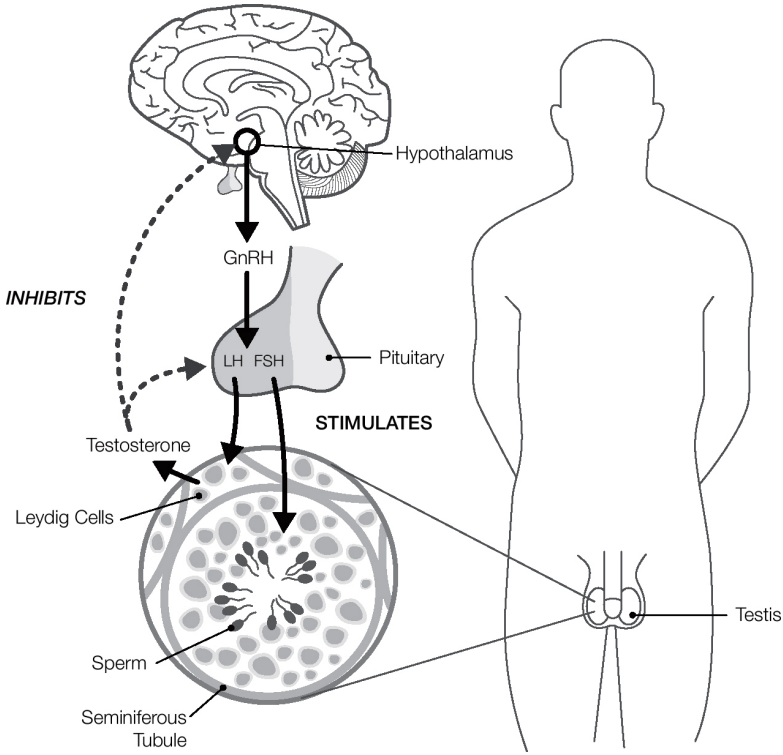


Figure 2 Regulation of testosterone production

What Can You Do?

Some causes of low T are reversible, but others are not. You *can* control what you put in your mouth. There's really no food that boosts your T level, but excess fat lowers testosterone.

Testosterone undergoes a chemical reaction in fat cells, which turns some of it into female hormones called estrogens. The fatter you are, the more your testosterone gets turned into estrogen. Fatty man boobs can become real boobs after a while. To make matters worse, the increased estrogens shut down the pituitary gland. So instead of kicking in with more LH signals when T levels drop, the pituitary gland doesn't react, and your testosterone gets lower still.

For every 4 to 5 kilograms/square meter increase in BMI, testosterone drops the equivalent of 10 years of aging.[8] Over half of obese men have low T.[9]

Another risk of poor diet is developing type 2 diabetes. One in three men in the United States will develop diabetes. If you have diabetes, you have a 50 percent chance of having low testosterone.[10] If you have diabetes *and* you are obese, your chances of having low T are greater than 80 percent! Throw in high blood pressure[11] or bad cholesterol (both of which about one-third of guys have)[12] and you are sailing into the perfect storm known as metabolic syndrome where your chances of having a heart attack, stroke, or some other cardiac problem are 350 percent higher.[13] Please, put down the fork!

Another thing you can control is your use of drugs and alcohol. Excess alcohol can cause liver damage, and this can result in overproduction of sex hormone binding globulin, that protein that sticks to testosterone and keeps it from working. Chronic marijuana use also lowers testosterone by messing with the pituitary gland. Heroin, methadone, and even pain pills with narcotics all can eventually shut down the pituitary gland and consequently switch off the testicles.

Then there are things you cannot control. Sometimes your boys come under direct attack. Testicular cancer strikes about 1 in 100,000 men. The testicle has to be removed, but the cure rate is well over 90 percent and in most cases the other testicle can make enough testosterone to do the job. In more advanced cases, chemotherapy or radiation is needed. The cure rates are still really high, but the added treatment can rough up the other testicle to where it just can't keep up. Really severe infections can permanently damage the testicles. Mumps can knock them both out at the same time. With infections, first there is a lot of swelling due to all the inflammation but, in the end, when the smoke clears, there is shriveling due to the damage done. Trauma, often during sports, takes an obvious toll. It's key to wear a cup when the boys may get in the game. It may not be comfortable, but I have had to remove a busted nut more than once from guys in jujitsu tournaments who found a cup annoying.

Sometimes the problem is in your head—literally. The pituitary gland that sends the go signal to your testicles can develop a tumor that shuts that signal down. Sometimes it's because the tumor is stealing the show, making too much of its own hormone, called prolactin, which upstages the LH and drives its level down. Another kind of tumor can arise that doesn't make

any prolactin but is so big it squishes the normal part of the pituitary so much that it chokes off any production of the signal.

A guy can be born with a condition that hurts his testicles and lowers his T. Some guys are born with an extra X chromosome, which carries instructions for female parts. These guys will still form normal penises, but the testicles will be small and will not produce sperm normally. In many cases the testosterone will be too low because the testicles cannot produce enough. In another genetic condition called Kallmann syndrome, the testicles can produce normal amounts of sperm but they don't get the LH signal from the pituitary gland in the brain. This is because the guy is born without part of the pituitary gland and the nerves for the sense of smell.

A more common scenario is growing excessive veins around one or both of the testicles. These varicose veins are known as *varicoceles*. The veins feel squishy in the scrotum and are described in textbooks as feeling like a bag of worms. They usually don't cause any trouble, but in a small percentage of guys their sluggish bloodflow heats up things too much, lightly roasting the nuts. The testicles are very finicky about temperature, and if the temperature is too warm by just a couple of degrees, the sperm can die off and occasionally testosterone production can take a hit. This is why our balls hang out but women's ovaries are tucked away nicely inside. The ovaries don't need this kind of special treatment. Also, this is why the sack will shrivel up when it's cold but go slack (and sticky) when it's warm —to try to keep that temperature constant.

Some boys are born with undescended testicles, where the balls don't make it all the way down into the sack. This can happen to one or both sides and is usually fixed very early in life. Even so, there can be some permanent damage from the little guys staying in the warmer abdomen instead of down in the cooler scrotum, and some of these boys can end up with low testosterone and poor sperm production, especially if both of the testicles didn't come down.

A more common cause of testicle injury is torsion, where a testicle gets twisted around and shuts off the very blood vessels that it hangs on. This causes a sudden and severe pain and has to be fixed within hours. It usually happens in younger boys and teens, so even if they end up losing the testicle, the other one

often grows a little bigger to make up the difference.

Really severe physical stress, as in a major illness or military combat, can lower testosterone too.[14] Men with kidney failure who are on dialysis will usually have low testosterone, as will many men with HIV. In these cases the stimulating signal from the pituitary is knocked down.[15] Even a small percentage of longtime endurance athletes will show a similar pattern, though not as severe.[16]

Finally, inevitably, there is Father Time. It is said he waits for no man, but maybe he waits a little for the man who takes good care of himself. Nonetheless, he comes for your testosterone, and he almost always gets it. Starting in his thirties, a guy's testosterone may start to slightly drop. By the mid forties, more guys start running low. Eventually, about half of men over 60 have low T, and by age 80 most men's T is half of what it was when they were 30. To make matters worse, as the testosterone level is going down, the sex hormone binding globulin is going up. This means that even less of the testosterone that is still being made is free to do its job. Furthermore, the pituitary gland doesn't kick in like it's supposed to. Even if it did, the testosterone-producing cells in the testicles start to disappear.[17] Most older men don't walk around feeling truly low, but certainly the signs of erectile dysfunction, muscle weakness, brittle bones, irritability, depression, and overall frailty are unmistakable for many.

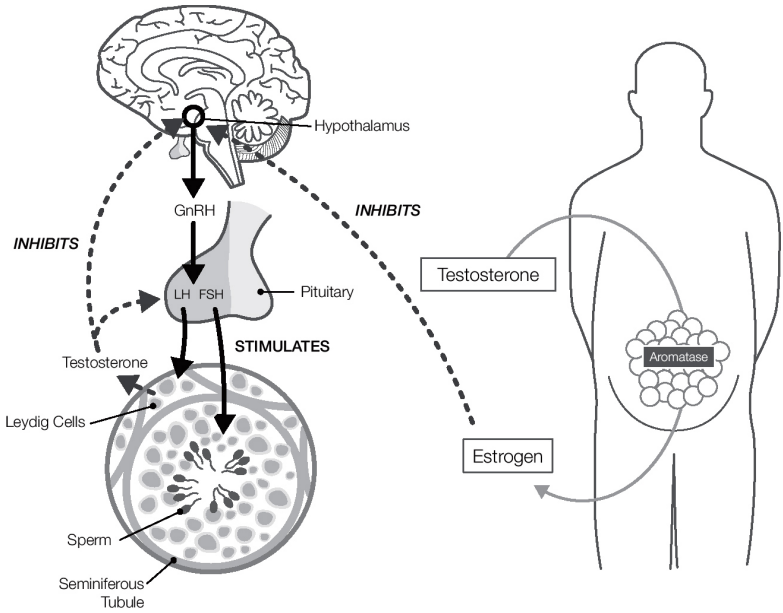


Figure 3 Fat lowers testosterone by turning it into estrogen, and estrogen lowers testosterone production.

Treating Low Testosterone

Once you've checked the fuel gauge and found its reading low, there are several different ways to fill 'er up. It's really important that you don't go to a self-serve station and self-medicate with testosterone acquired without a prescription. You need full service with the supervision of a knowledgeable physician. Testosterone is a prescription drug for a reason, and in order for you to get the best results while avoiding serious side effects, the testosterone needs to be dosed properly and you need to be monitored regularly. The options include injections, implants, ointments, gels, liquids, patches, nasal sprays, and even a small globule that sticks to your gum, called Striant. Testosterone pills are not FDA approved in the United States because they can harm your liver. The same is true for any oral anabolic steroid. Watch out for herbal supplements that claim to boost testosterone naturally because they are often spiked with actual oral testosterone. In Europe there is a special formula of testosterone known as testosterone undecanoate that does not hurt the liver, but it is not as effective and reliable as the other types of

testosterone treatments because it can be affected by what you eat and when you eat it.

When testosterone is put on through the skin, either as a patch or rubbed on, it wears off after about 24 hours so it has to be applied every day. It becomes a part of the daily grooming routine, like brushing your teeth or shaving. Unlike grooming, you can't really skip it on a lazy weekend or a camping trip because these applications only last 24 hours.

The goal of these formulas is to get enough testosterone to bring you up to normal. For purposes of feeling well, good health, and longevity, the goal is to get into the range of 400 to 600 nanograms/deciliter. Going higher rarely changes how good you feel, and it's not necessary from a long-term health standpoint. After you start on the T, the doctor will give it a couple of weeks or more to reach a steady state and then check your blood level again. If your T is too low or high, your doctor will advise you to change the dose.

Unfortunately, about 15 percent of men just cannot absorb testosterone very well through their skin. These tough-skinned guys will not get to the levels they need, even if they slather on extra formula. This is one reason why it's so important for you to be monitored by a doctor and get your blood levels checked once you start down this path. For all you know, you may be one of the poor absorbers and you may be wasting your time and money.

With most formulas, enough testosterone is usually in your system by about 2 hours after application, so you can swim or shower at that point. But be careful, because even 24 hours later some of the testosterone you put on your skin can rub off on someone else's skin. It's recommended to take the added precaution of covering up the skin with a T-shirt. You will need to wash off the areas where you applied formula before any intimate contact. Try not to rub your exposed skin against children either. The T that rubs off can cause a woman to develop male characteristics or a child or infant to show signs of puberty —such as increasing pubic hair or inappropriate increase in size of the genitals—way too soon.

A tried-and-true method for getting testosterone into a guy is a needle. Granted, it hurts more than a gel or lotion, but it has its advantages too. For starters, it always works. There's no one

whose skin is too tough for a needle. There is also no risk of transferring testosterone to someone else.

Your doctor or the nurse will either give you the shots or teach you to give them to yourself. The injection is into a big muscle such as the thigh or the butt. It's very manageable, but proper technique is important to help you avoid hitting a blood vessel or nerve. The dose the doctor chooses will be based on how often you get your shot. The testosterone slowly seeps out of the muscle into the bloodstream, and after a week to 10 days, half of it will be gone. Less frequent shots are more convenient for guys who go to the doctor's office for their shots, but the trade-off can be feeling more of a roller coaster of highs and lows. My preference for my patients is a weekly injection, and I teach them to do it themselves. Twice a week with an even lower dose is good for a few guys who really feel the difference between the beginning of the week and the end of the week, but this isn't necessary in most cases. A longer-lasting injection known as AVEED must be given in the doctor's office, but it lasts for 10 weeks.

If getting a shot every 10 weeks is still too much hassle, then consider the implantable pellets. Several of these pellets are tunneled into the buttocks through a small nick in the skin after the doctor numbs you up with a shot of lidocaine. The pellets dissolve more slowly than the oil-based T injections. Normal T levels can be maintained for 3 months and, in some cases, even up to 6 months. Once the pellets are in, a butterfly bandage is placed and you have a sore butt and maybe a bruise for a few days. Occasionally there can be bleeding that requires more attention or an infection, but this is pretty rare.

Not everyone can handle needles, and when the skin-based formulas don't work, there are still other options such as Striant, a small globule that you put on your gum twice a day like a little pinch of chewing tobacco. It's like a testosterone patch for your gum. Natesto is a gel you squirt up your nose three times a day.[18]

Where Did My Balls Go?

When you use testosterone, it powers down your testicles. The testosterone that you put into yourself circulates to the pituitary gland, which senses that you have "enough" testosterone and so

stops trying to get your testicles to make more. Without the LH signal from the pituitary, the testicles stop making any testosterone at all. The pituitary also stops sending the testicles the follicle-stimulating hormone (FSH) signal to make sperm, and that is why guys who take testosterone get shrinkage of their testicles. This shutdown occurs in only a few months. The only way you can protect your testicles while you are on testosterone is to be prescribed low-dose HCG (human chorionic gonadotropin) injections *every other day*.[19] Even this is not foolproof, but the only time it's really important is for guys who need the sperm because they're trying to have a child.

A more common solution for guys who have low T but are trying to have a child is for a doctor to prescribe a pill called clomiphene citrate (aka Clomid), which tricks the good old pituitary gland into making even more LH and FSH signals to make the testicles produce more of their own testosterone and keep churning out sperm. Instead of shutting down the testicles, it revs them up. Many people think of Clomid as a female fertility drug, but in this case what's good for the goose is also good for the gander. Side effects can be mild strain on the liver or feeling less sexual in spite of higher testosterone. Also, estrogens can get boosted along with testosterone, so close monitoring is important.

Another pill that can work, particularly in obese men, is anastrozole, brand name Arimidex. It blocks the fat cells from turning testosterone into estrogens. This raises the testosterone without turning off the pituitary signals to the testicles. It can also be used to lower estrogen levels if they get too high while on Clomid. Arimidex is available by prescription and its use needs to be monitored because if it lowers the estrogens too much, the bones can get weakened.

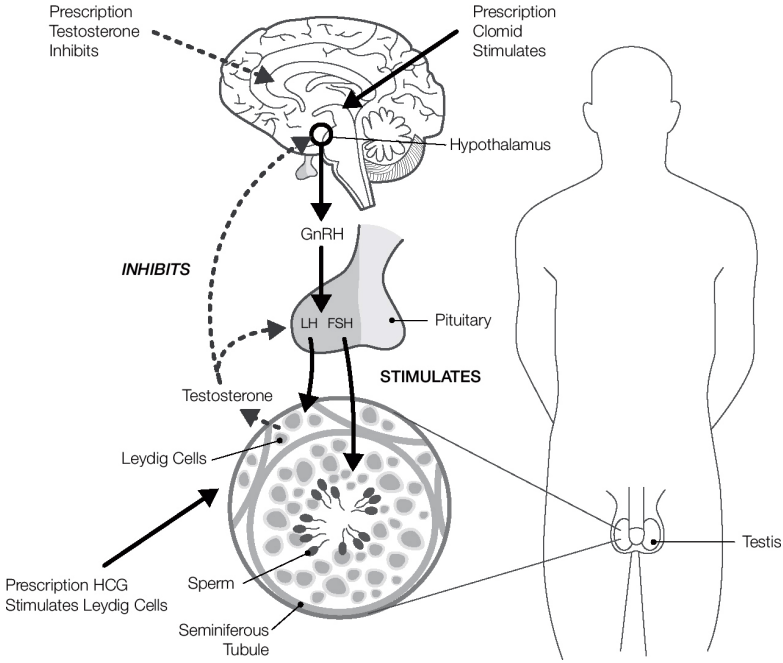


Figure 4 Effect of prescription hormones on testosterone production

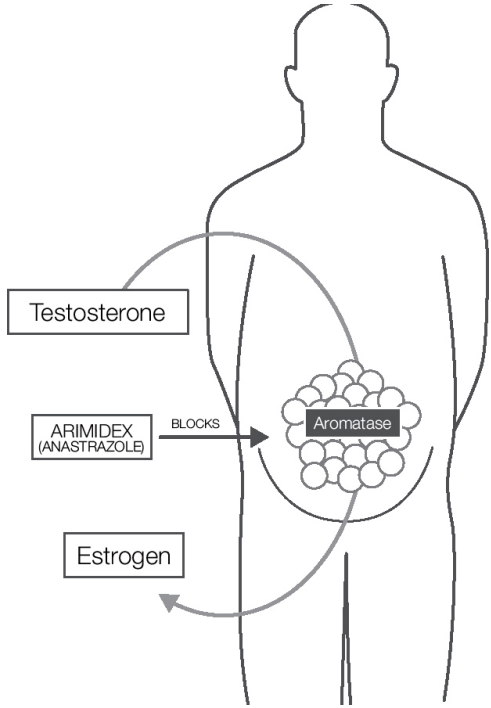


Figure 5 Blocking the conversion of testosterone to estrogen with Arimidex

Risks and Benefits of Testosterone Replacement

The benefits of testosterone are the same regardless of the mode of treatment. It restores good health and prevents other problems down the line. Restoring testosterone to normal lowers the risk of getting diabetes or lessens its severity. It lowers the risk of becoming obese while helping build muscle. It prevents bones from getting brittle and helps build back weak bones. It reverses depression and anxiety when they are due to low T. The vast majority of studies also indicate a benefit to cardiac health, lowering the rate of heart attacks, strokes, and death.[20, 21]

T replacement actually increases the life span of men, compared to those who go without treatment.[22]

Okay, life and death, blah blah blah, but what about *sex*? Testosterone restores sexual desire in men who are low, but desire is a complex emotion, and even when T levels are normal

other issues may get in the way. Even so, if T is low, there isn't a chance for normal desire no matter what the other issues may be. Testosterone improves erections, but usually not as a "standalone" drug. In older guys, other health issues may cause erectile dysfunction. In such cases pills or injections will often be required to pump up the bloodflow. But without restoring testosterone, those medications will often not work well enough, so T replacement can make all the difference. It can sometimes take many months for the testosterone to revive the penis tissues fully or at least enough that they respond better to the penis pills or injections. Restoring testosterone can restore pleasure and sensation during sex as well, and sometimes increase the ability to reach a climax or ejaculate.

The good news is testosterone can really help a guy when he is down. The bad news is that, as with any medication, there are side effects and risks. One side effect is swelling in the legs. This is uncommon, but water gain can give you a few more pounds on the scales when you first get started. Also, as the levels of T in your system get higher, you may develop acne and you may get some nipple tenderness. If the levels are getting too high, you may even get some breast tissue growth as the excess T is converted to estrogens in your fat cells.

Testosterone can overstimulate your red blood cell production, leading to thicker, more sludgy blood, so your blood counts should be monitored and if they get too high the doctor will likely lower the T dose or stop it altogether. You may even be instructed to have some blood removed. Testosterone can lower your voice because it can increase the size of your larynx (voice box), but this can also aggravate sleep apnea if you have it.

Prostate cancer is common, but no more so in men on T than in men off T. Nonetheless, your prostate should be monitored at least once a year with a rectal exam and a PSA blood test. The official label from the FDA states that T replacement should not be used in anyone with a risk or history of prostate cancer. In many expert urology practices, as long as a guy has had a prostate cancer treated successfully, he can get back on T replacement. Some doctors will even treat men with prostate cancer that hasn't been removed but watch them very closely. A less common but more dangerous risk is breast cancer. Although it is rare, it can be exacerbated by increased amounts of estrogens

that may form in the fat as T levels rise. No one with a history of male breast cancer should use T.

For the vast majority of men who need testosterone replacement, the benefits clearly outweigh the risks. As with any legitimate medication, treatment should be under the supervision of a knowledgeable doctor, with regular monitoring of blood levels and regular physical examinations. If you suspect your testosterone is low, check with your doctor and make sure you are running on all cylinders.

CHAPTER 14

PUT IT IN YOUR MOUTH: How Grub Affects Your Nub

Ever play hide the salami? Well, you should, but I don't just mean the obvious thing here. It turns out that hiding meat from your dinner plate is also a good thing for the health of your penis (and your other parts as well). A lot of scientific studies have examined how diet affects the penis, and the results keep pointing in the same direction—towards the produce section of the grocery store.

The insides of the penis chambers that fill with blood are spongy. Each tiny space has two layers—a special lining cell layer, backed by a very thin muscular layer. The lining cell layer, called *vascular endothelium*, is the same type of cell layer that lines all the blood vessels of your body, from the large, pulsating aorta arising from your heart to the tiniest capillary in your little toe. This layer releases a variety of amazing molecules. One in particular, nitric oxide (NO), is critical to the health and function of your "meat." In fact, it is critical to healthy bloodflow in all your other favorite parts—including your heart and your brain, and yes, your little toe. The NO molecule makes the muscle lining stretch, which opens up the spongy spaces of the penis so that they fill with blood, making the penis hard. NO also prevents the spongy tissue from aging and shriveling up. Even though the lining cells can make NO on their own, you can give your penis more by eating certain foods. Furthermore, as we get older, our body's ability to make its own NO declines, so the more we can help it along when we are young, and the more we can compensate when we age, the better.[1] What you put in your mouth directly affects how much NO your penis sponge can get and how healthy the tissue stays. If the tissue becomes unhealthy, it loses its ability to stretch out and fill with blood, and you no

longer “get pumped.”

When you go grocery shopping for your penis, or you take it out for dinner, keep in mind that some foods pump up the NO, while other foods actually block NO and even harm the special spongy tissue. Ultimately the menu for success contains lots of vegetables, especially the green leafy ones, and moderate intake of seasonal fruits, especially berries. It contains little or no processed carbohydrates, processed oils, or animal products. The produce section is like nature’s pharmacy. Vegetables and fruits are made of thousands of molecules that nourish and repair our body in ways we are only beginning to understand. In the penis, NO is a gas that lasts for only a few seconds after it is released. We don’t actually eat food that has NO in it, but rather we eat food that has *nitrates*, *NO_3*. Lots of foods contain nitrates, including hot dogs and other processed deli meats, but these foods have other ingredients that are *not* good for *your* meat. The best sources of nitrates are powerhouse vegetables such as beets, lettuce, arugula, and spinach. Other vegetables, such as peas, potatoes, and tomatoes, contain less than 10 percent of the nitrates that the powerhouse veggies do, but we tend to eat them so much more often that they end up providing the bulk of the nitrates most people consume.[2]

It’s important to get your nitrates from whole foods. A plate of green leafy vegetables will provide more nitrates than your body can produce on its own.[3]

And it’s even important to chew that food. You see, we, like all mammals, have been chewing our food for millennia, and have special bacteria in our mouths that break down *nitrate (NO_3)* into *nitrite (NO_2),* which eventually gets broken down in our gut into *nitric oxide (NO)*. These bacteria live in the deep cracks in the back of our tongues. Unlike most bacteria in the outside world, they rely on *nitrate* instead of oxygen. What’s really interesting is that the nitrate these bacteria use does not come directly from the chewed up spinach in your mouth, but instead from the saliva that you secrete when you chew. The nitrate from the food you eat first has to get absorbed in your small intestine, and from there, it gets into your bloodstream. Then the blood drops it off back in your mouth in the salivary glands, where it gets concentrated 20 times. When you chew, saliva is secreted and the bacteria hiding in your tongue convert

the nitrate from the saliva into nitrite. You swallow the nitrite and, in your stomach, the acid there converts it to nitric oxide—finally! Other plant nutrients such a polyphenols and vitamin C make these reactions possible. Some nitrate that gets past your stomach is absorbed in your large intestine, where it gets into the bloodstream to be converted into NO by a few different pathways, including one that requires the red blood cells themselves to make it work.[4] The NO you get from food works along with the NO that your own tissues make to do its magic on your wand, as well as the rest of you.

So why not just take nitrate supplements? Because nitrates are just part of the puzzle. Thousands of other plant chemicals (phytonutrients) come into play. Their functions and benefits are just beginning to be understood. The most studied group of phytonutrients is called *polyphenols*. So far, more than 8,000 different polyphenol molecules have been identified, 6,000 of which are categorized as flavonoids. So which ones should you choose? The answer is that we really don't know. Some fruits and vegetables have more of one kind than another, and the same kind of vegetable can have more or fewer, depending on where and how it was grown. Some are inactivated by heat, so it's important to include raw vegetables in your diet whenever possible.

Flavonoids can increase production of NO or keep NO from being destroyed. They do this in complex ways, working alone or in combination with each other. They improve blood vessel health, both with and without nitrates and nitrites. Some protect the blood vessels from the damage of a high-fat meal. Some prevent toxic cell-damaging chemicals from ever forming. Flavonoids lower blood pressure in people with high blood pressure. This matters to your penis because high blood pressure makes the muscular layer of the penis sponge too muscular and less able to stretch out and expand with blood. With so many possible combinations of effects, it's impossible to say which of the many thousands of phytochemicals is the most important. The best approach is to try to get as many of these molecules into your mouth as you can.[5]

You don't need to have a subscription to a nutritional science journal to eat the right fruits and vegetables. Studies that simply looked at people who ate a lot of fruits and vegetables, regardless

of the variety, showed these people have less heart disease and less high blood pressure, and yes, better erections.[6] They live longer too.[7]

But if you care to peel back the onion, there are theories and some pop science suggesting that some varieties of vegetables, fruits, and grains may trigger inflammation in some people due to higher levels of naturally occurring "antinutritional" molecules called lectins. The theory is that these molecules may get into the circulatory system by breaking through the normal barrier of the intestine and that they then cause your immune system to overreact to your own body. Gluten is an example of a lectin, but there are many other lectins and other "antinutritional" molecules, for that matter. Cooking and fermentation can neutralize lectins. Red kidney beans have a high concentration of lectins, and eating them raw or even undercooked will give you severe food poisoning—but they're safe if they're fully cooked. Leafy vegetables, root vegetables, and cruciferous vegetables are lower in lectins than beans, some fruits, seed-bearing vegetables like tomatoes, cucumbers, and squash (which are actually fruit), and whole grains, where lectins largely reside in the husks.[8] Others point out the potential medicinal benefits of lectins, including anticancer applications.[9]

Maybe this diet sounds like no fun at all. Well, there is some wiggle room. Turns out that one of the most decadent foods of all can actually be good for your penis. That's right: chocolate. Chocolate lovers were found to have close to a one-third reduction in cardiac disease and stroke, which means healthier hearts pumping more blood through healthier blood vessels to healthier penises.[10] The effect is believed to be due to the very high levels of flavonoids in chocolate that boost NO, amongst other benefits. Cocoa is, after all, a fruit. If you are a fan of pistachios, get crackin' because men in a Turkish study (they grow a lot of pistachios in Turkey) who ate a cup and a half of pistachios a day were more likely to bust a nut at night.[11]

5 Colors of Phytonutrients

Red Benefits

Supports prostate, urinary tract, and DNA health. Protects against cancer and heart disease.
Phytonutrients: lycopene, ellagic acid, quercetin, hesperidin, anthocyanidins

Purple Benefits

Good for heart, brain, bone, arteries, and cognitive health. Fights cancer and supports healthy aging.
Phytonutrients: resveratrol, anthocyanidins, phenolics, flavonoids

Green Benefits

Supports eye health, arterial function, lung health, liver function, and cell health. Helps wound healing and gum health.
Phytonutrients: lutein/zeaxanthin, isoflavones, EGCG, indoles, isothiocyanates, sulphoraphane

White Benefits

Supports healthy bones, circulatory systems, and arterial function. Fights heart disease and cancer.
Phytonutrients: EGCG, allicin, quercetin, indoles, glucosinolates

Yellow Benefits

Good for eye health, healthy immune function, and healthy growth and development.
Phytonutrients: alpha-carotene, beta-carotene, beta cryptoxanthin, lutein/zeaxanthin, hesperidin.

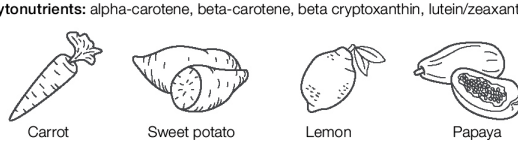


Figure 1 Phytonutrients come in all colors, shapes, and sizes.

The Sweet Truth

So, now the bad news: Processed carbohydrates are bad. No way around it. *Processed carbohydrates* is a fancy way of saying "sugar." When you eat sugar, it gets absorbed rapidly into your bloodstream and it's used as a source of energy. Of course, we

need energy, but given the amount of sugar we need compared to the amount of energy we tend to put in our mouth in the form of sugar, the result is like flooding an engine. Insulin allows the sugar to go where it's supposed to, into the cells. When you take in more energy than you need, it gets stored away as fat. This fat isn't just a problem for your wardrobe, it's a problem for your health. Fat gets deposited in your liver and around your organs. This excess fat actually causes inflammation, which releases toxins into your blood called *free radicals*. Not to be confused with idealistic college protestors, free radicals are harmful molecules that go around oxidizing your tissue. When steel oxidizes, it becomes rust. When your tissues oxidize, they degrade, malfunction, and age. A host of other harmful molecules is released as well. Even if you aren't overweight, right after you eat processed sugar, your body is triggered to release other toxins into your blood. These toxins released from a sugary meal or from excess fat also interfere with NO production. Over time, these free radicals and other toxins hurt your body's ability to release insulin, making a bad situation worse. This eventually leads to prediabetes, and then to diabetes, and then to the dreaded metabolic syndrome—a constellation of high blood pressure, clogged arteries, heart disease, and stroke.[12] But long before your heart or brain takes the hit, your little soldier will likely die in bed.

Okay, so maybe you don't go out of your way to eat sugar cubes, but sugar is lurking *everywhere*. When America went "low fat," all the major food manufacturers got on board, but there was a dirty little secret that we have only recently recognized. Food without fat doesn't taste nearly as good, so to keep the consumer happy, food manufacturers substituted simple carbohydrates for fat. In fact, low-fat, low-calorie foods have even *more* sugar than regular versions—up to twice as much. The fattier the food is naturally, the more sugar is used to make the low-fat version.[13] Why? Because it tastes better, but this has wreaked havoc on our population and is a big reason that we, as a society, are fatter and more impotent than ever.

Sadly, this wasn't simply a mistake. Beginning in the mid-1960s and through the 1970s, the sugar industry's primary professional organization, the Sugar Research Foundation, actually promoted changing the American diet to low-fat foods in

order to boost the sugar market, all the while concealing evidence that sucrose caused elevated cholesterol and heart disease. Unfortunately, the FDA ultimately let the sugar industry influence recommendations for the low-fat diet that was supposed to reduce cholesterol-related heart disease but instead has led to record levels of obesity, diabetes, and heart disease.[14]

It's not enough just to avoid sucrose—the sugar that's in sugar packets. Sugar is also hidden in starch. Starch is nature's way of efficiently storing sugar in a more complex molecule. In fact, starch is converted to simpler sugar molecules as soon as you put it in your mouth by enzymes in your saliva that surround it and break it down. The more refined the starch, the easier it is to break it down.

Fruits, vegetables, and grains all have varying degrees of starch and sugar, also known as carbohydrates. In the natural state of fruits, vegetables, and grains, these carbohydrates (starch and sugar) are attached to other molecules such as fiber and protein that keep them from being digested and absorbed rapidly when you eat them. These attached carbohydrates are therefore called "complex carbohydrates." Fiber itself is a complex carbohydrate. Because of its complex arrangement, it cannot be rapidly absorbed into your bloodstream. Some of the complex carbohydrates will just pass through you, and in some cases the fiber will actually draw some fat or sugar out of you on its way through. But simple sugars like sucrose and high-fructose corn syrup don't have complex molecules to keep them out of your bloodstream. The same goes for "simple" or extracted starches, such as white flour and white rice or cornstarch and potato starch. These starches are missing the other, more complex fiber and protein molecules that would be in the wheat husk, the rice husk, or the potato or corn itself.

It's best to avoid processed foods, particularly "light" or "low-fat" versions. Avoid things made out of white flour such as most breads, rolls, pastas, pastries, cakes, cookies, breakfast bars, and many cereals. Avoid white rice and food made from rice starch, including cereals and gluten-free breads, cakes, and pastries. Avoid obviously sweetened foods such as soft drinks, sweetened tea and coffee, ice cream, and desserts. Furthermore, when you look at food labels, be aware that sugar or additives that become sugar can masquerade under other names, including *anhydrous*

dextrose, lactose, malt syrup, maltose, fruit nectar, agave, corn syrup, and *fructose*. Artificial sweeteners may have no calories, but your brain knows it and drives you to get more calories anyway. If you must feed your sweet tooth, consider a safe, natural sweetener, such as erythritol.

Fat Facts

So that brings us to fat and meat. Now that it turns out low-fat diets didn't help us, the FDA has been convinced to let go of the reins when it comes to fats. The latest recommendations for healthy eating place no upper limits on fat consumption. But can that be right? Can we really eat all the bacon we want? Not likely. The same studies that show a rush of bad chemicals after eating a high-sugar meal show the identical thing happening after eating a high-fat meal. What about good fats versus bad fats? While it's true that essential fatty acids such as omega-3 fatty acid are good for us, they are present in grains, seeds, and nuts and are probably better used by our bodies if we ingest them that way. What about olive oil? Is there really a good oil? A study comparing blood vessel health in young, healthy volunteers after consuming a meal rich in olive oil showed the same old decrease in bloodflow as with any fats, and the toxic molecules causing it were just the same. In this study, olive, soy, and palm oils, both raw and cooked, were also compared and were all just as bad.[15] So when it comes to your penis, the best oil is massage oil!

What about the Mediterranean diet? This is a recently popularized diet that incorporates a lot of olive oil. And yes, a Mediterranean diet has indeed been shown to improve blood vessel and heart health in comparison to the typical Western diet.[16, 17] On closer inspection, the Mediterranean diet is not just about olive oil. It mostly consists of fresh vegetables, fruits, whole grains, and nuts, with small portions of fish and modest portions of wine. When you look at a Mediterranean meal, you realize that most of the food is the good stuff: vegetables—plenty of green leafy ones—fruits, nuts, grains, and even red wine—full of phytonutrients, the polyphenols, flavonoids, and antioxidants that promote healthy bloodflow and healthy tissues. Taken with the olive oil, they are probably playing defense, letting the oil provide flavor and satisfy the brain's craving for fats without the

unmitigated damage of the oil alone.

Pitfalls of Protein

Okay, now to beat the meat. What about grass-fed, lean organic beef? What about hormone-free, organic milk and cheese? What about free-range, organic chickens and eggs? What about fresh wild-caught fish? They all have one thing in common: They cost more. But are they really healthy? Well, they are probably healthier than their nonorganic, factory-farm-raised equivalents. But are they good for you like fruits and vegetables are good for you? The answer is no, or at least not likely. Protein is absolutely essential for our bodies, and without it, we would starve and die. Animal protein, whether from steak, chicken, fish, or dairy, is a very concentrated form of protein. A little goes a long way, but as with simple carbohydrates and fats, modern technology has brought way more animal products to our plates than we are truly adapted to eat. Now, it is true that certain populations, such as the Plains Indians who ate mostly buffalo, adapted to a mostly meat diet. But for the vast majority of humans, animals were scarce and consumed in much lower portions than what we get served up at the drive-thru window, at the restaurant table, or even at home when we cook what is waiting for us shrink-wrapped in our freezer.

We actually get enough protein for good health from fruits and vegetables. After all, every cell in a living plant or animal has protein, but it's much denser in animal muscles than in lettuce leaves. Animal protein is also different from plant protein in that it contains all the amino acids our body uses in each bite. Amino acids are the building blocks of protein. Our bodies make many, but a few we can only get by eating something else. Plant proteins lack one or another of these amino acids, but over the course of a few meals, depending on your meal plan, all the amino acids are provided by plants. You don't have to worry about combining vegetables just right at a certain meal. As long as you eat a variety of produce, your body will know how to store and combine the amino acids it needs. The one nutrient that you do need to supplement if you go strict vegan is vitamin B_{12}. About 100 micrograms per week by mouth is fine. B_{12} used to be available in fruits and vegetables that had a little dirt on them

because the bacteria in the soil provided it, but that's hard to come by in our modern grocery stores.[18] Vitamin D is in beef, but your body can make plenty if you get enough sunshine.

There is growing evidence that high levels of animal protein itself, not just fat, result in the same blood vessel disease as do excess simple carbs and excess fat.[19] Other diseases and cancers are linked to high animal consumption, including prostate cancer.[20] A recent study in mice demonstrated that cutting back on two amino acids, serine and glycine, slowed down certain cancers. Animal products such as meat and eggs have much higher levels of these amino acids than green leafy vegetables—and so do soy and nuts, which are touted for their protein.[21]

So how much protein is the right amount? In the world's Blue Zones, where people live the longest, they are, more often than not, eating very few animal products. In rural Asia, for example, where heart disease and many cancers occur at a fraction of their levels in the West, animal products make up only about 5 to 10 percent of the total diet.[22] A massive study of more than 60,000 people in England demonstrated that vegetarians and those who ate only small amounts of meat had lower rates of many cancers compared with meat eaters.[23]

What about fish? Isn't fish supposed to be good for your heart? The answer is that it's better than fatty meat but, in reality, the waters of the world are so heavily contaminated with mercury that there really are no untainted fish to eat. Mercury poisoning causes nerve and muscle damage and brain damage to unborn children. It's a real risk for people consuming more than just a couple servings of fish per week. In fact, pregnant women are advised to avoid fish. Big fish store the mercury from little fish in their fat. "Premium" fish such as tuna or yellowtail have much more mercury in them than do cheap little anchovies. Farm-raised fish are often fed fish oil and therefore have higher levels of mercury as well.

Alarming Additives

There's no end to the list of additives food scientists have concocted to flavor, color, texturize, and preserve the food we eat. One in particular deserves special mention: phosphates. Phosphates are found in dark colas and in a wide variety of

packaged and processed foods. Elevated levels of phosphates cause the smooth muscles in your arteries to change into bone cells, become calcified, and harden, leading to erectile dysfunction and eventually cardiovascular disease. Phosphates are everywhere, and they don't always get listed on the label. They are in popular breakfast cereals and they are in processed meats. They are in coffee creamers and they are in flavored waters. They go by many names, such as *phosphoric acid, disodium phosphate,* and *tricalcium phosphate,* but usually hidden somewhere in there is the root word *phosphate*.[24] Phosphates are also found naturally in plants, but at much lower levels and bound up in a way that makes them not affect your circulation in the same devastating manner. Rule of thumb: If it's in a wrapper, box, or can, think twice about putting it in your mouth.[25]

Why would we be built to crave the very stuff that's bad for us? Probably because sugar, fat, and protein are all critical nutrients that our body and brain absolutely need for survival. The problem is that our modern technology has given us too much of a good thing—to the point where now they have become toxins. It's like oxygen. You need oxygen to live, and our atmosphere is about 20 percent oxygen, but if you breathe 100 percent oxygen from an oxygen tank for an extended period of time, it will be highly toxic to your lungs because it oxidizes their lining with free radicals. Just as our atmosphere contains less oxygen than oxygen tanks, food that occurs naturally contains a much smaller percentage of sugar, fat, and protein than what we manufacture and process. So here's the problem: Our brains evolved to seek sugar, fat, and protein in a world where they were scarce. That part of the brain doesn't know that we discovered agriculture and industry and now there's way too much sugar and fat and animal protein out there, so our brain keeps driving us to eat them. Furthermore, the level of sugar and fat we eat on a regular basis causes our brain to set that level as "normal," and when we drop below it, the brain thinks we haven't eaten enough and generates a craving.

Fortunately, your brain can be reset if you give it a few months. The same plate of vegetables that seems cruel and unusual will actually satisfy you several months later if you stick with the new regimen. It's not easy, but eventually the craving does go away as the brain resets to the new normal. But let's face

it, it's not likely that you or I will adhere to a pristine diet all the time. Well, don't despair—there's a workaround. It turns out that eating natural produce—vegetables, fruits, and whole grains—is not only a good offense to keep you in the game, but actually plays defense when you choose to eat something less healthy for your penis. It turns out that if you eat a lot of green leafy vegetables or other polyphenol-rich food along with simple carbs or high-fat, animal-based foods, there is a protective effect, and fewer toxins and free radicals are unleashed on your blood vessels and tissues.[26]

I personally take a 90/10 approach. I try to keep my meals about 90 percent plant based, without excess fats and simple carbohydrates, but I flex out to anything and everything when I'm served a meal caringly prepared by friends or family, or when I am celebrating or vacationing with others. Like we say in surgery when we irrigate a dirty wound, the solution to pollution is dilution. So eat the tasty "bad" stuff if you must—just not all the time.

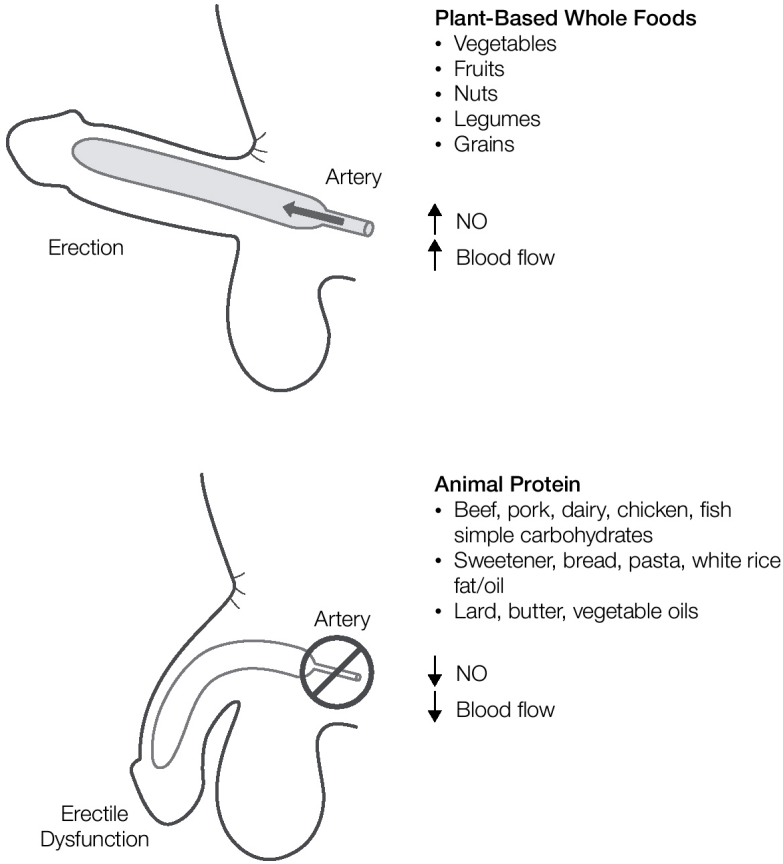


Figure 2 Summary of nutrition effects on the penis

CHAPTER 15

SEXERCISE: Flex Your Sex

When I was undergoing my medical training, one of my mentors (a great former penis doctor) asked our eager team of students, "What is the most important organ in the body?" We thought for a second, and then the most eager (and most cutthroat) shouted out "the heart!" "Yes, indeed," said the professor. "And do you know why the heart is the most important organ in the body? Because it pumps blood to the penis!"

Of course, the heart pumps blood to every body part, and every part is important, but let's face it, the penis is in a class by itself. Exercise is critical to penis health because it keeps the heart and blood vessels strong and healthy and, the better they pump and flow, the better things are for your penis. Exercise not only strengthens the heart muscle, it releases a cascade of molecules that protects the blood vessels from disease. Exercise also helps you cut fat, which is a source of toxins for your chubby and a drain on your testosterone. Almost all exercise is good for the penis, but there are specific situations where exercise may cause more harm than good. Although the penis is not a muscle, much of it is surrounded by specialized muscles. Exercises of these specific muscles—let's call them "sexercises"—can help keep the penis pumping stronger and longer.

When you sit on the couch all day, you don't just get soft, you actually get inflamed. Being sedentary allows you to accumulate actual inflammatory molecules in your bloodstream that hurt those precious penis blood vessels, turning you into a couch potato spud—not stud. Fortunately, exercise clears the inflammatory molecules from your blood. When your muscles contract, they release molecules that spring into action, fighting back the inflammatory molecules and restoring nitric oxide (NO)

to the blood vessels. Additionally, the sheer force of blood pumping through the blood vessels during exercise results in molecules being released that pump up the NO.[1]

The more you exercise, the more you win this war against inflammation. Of course, like anything, you can overdo it and push so hard you get tissue damage, which is a whole different kind of inflammation. This is occasionally seen in marathoners or other extreme endurance athletes. But for the vast majority of us, overdoing it is not the concern. We have to get off the couch if we want quality time in bed. Study after study show that exercise prevents erection problems. A study demonstrated that even if you account for age, smoking, obesity, and cholesterol, the fitness and activity level of a guy is incredibly important for his sexual function. Inactive men had more than 10 times the risk of having erection problems compared to active guys. And it matters *how* fit you are. Merely "tolerably fit" guys had four times the risk of problems, compared to guys whose fitness was measured as "good."[2]

Exercise can reverse erection problems, even in men for whom pills such as Viagra or Cialis fail![3] The amazing thing about exercise is that it seems to have a benefit to the penis that is not just related to weight loss or lower blood pressure. Even if a person is thin, he may have better erections with exercise versus without. Guys who don't exercise seem to have more adrenaline-like signals constricting their penis bloodflow even when they are resting.[4]

Even men who control their blood pressure and cholesterol with medication will still have better erections with exercise.[5]

And the more, the better. Compared to long walks at sunset, vigorous exercise for an hour three or four times a week resulted in substantially better erections.[6] So no cheating—get out there and get pumped!

Battle of the Bulge

Are you too sexy for your shirt? Or just too big for it? When you look down, can you still see Mr. Happy? Overweight is the new thin, and obesity is at epidemic proportions. That spare tire isn't just embarrassing at the beach; it is actually making you sick. The fat cells themselves are like little factories that belch pollution

into your bloodstream. These “free radicals” are inflammatory, and they go to work destroying your circulation. They go by the names of *tumor necrosis factor alpha* (*TNF-a), interleukin 6 (IL-6)*, *C-reactive protein* (*CRP),* and *arginase*. They cause your body to stop responding to insulin, which then leads to the metabolic syndrome and diabetes. These molecules, along with excess cholesterol and other fats, increase plaque buildup in the walls of the blood vessels. Perhaps most importantly, they directly decrease the production of NO, which is the key trigger to bloodflow throughout all blood vessels and to your penis. So excess fat isn’t just hiding your penis, it’s hurting it too.

A gut also increases the risk of high blood pressure and can even lower testosterone. Guys have to lose the gut if they want to keep the spark. Fortunately, many studies prove that staying lean prevents erection problems and losing weight can restore your chubby. It turns out that overweight men as measured with a body mass index (BMI) of 25 to 30 have a 30 percent chance of having erection problems, and that number goes up as the BMI goes up. A BMI above 30 is considered obese. Losing weight significantly restored normal sexual function in men in clinical trials. Furthermore, these guys benefited from an increase in testosterone and improvement in blood pressure.[7, 8]

Testosterone and Exercise

Contrary to popular belief, lifting weights does not boost your testosterone in a meaningful way. It is true that the muscles will release micro amounts of testosterone as they are actively straining, but not enough to make a measurable difference over the course of a day. Excess fat will lower testosterone by converting it to estrogens, which are female hormones. Exercise helps you burn off excess fat so, in this way, exercise can help raise your testosterone. This is true whether we are talking about weight training or cardiovascular conditioning.[9] Exercise taken to an extreme, however, can actually *lower* your testosterone. Elite endurance athletes often have testosterone levels at the lower end of the range. Soldiers subjected to severe boot camp training do as well. This is probably a “low-battery mode” type of mechanism of the body to preserve itself in extreme states since testosterone makes the body utilize energy to build up tissues.[10]

Ride Hard: Bicycles and Erections

Not all exercise is created equal, and one exercise may even *hurt* your erections. That exercise is bicycle riding. Now, this is a bit of a tricky area because there is no question that bicycle riding is an excellent way to promote your cardiovascular conditioning. It gets the heart working and the blood pumping with that great cascade of molecules that improves the health of your penis *but* ever notice that sometimes your nub gets numb after a good bike ride? This can be a problem. The nerves can get pinched and injured from what is otherwise great exercise.

Unfortunately, the traditional bicycle seat is perfectly shaped to press right on the very tips of your *ischial tuberosities,* the butt bones you feel when you sit on something hard. The problem here is that the arteries and the nerves that go to your penis run right along the rim of these bones and get squeezed from the pressure of the bike seat. Not only that, the nose of the bike seat pushes up towards your pubic bone as you lean forward on the seat, and this squeezes the nerves of the penis. These nerves start in the spine and have to wrap around the rim of your pelvic bones to get to the penis, and leaning forward on a bicycle also stretches those nerves a bit. Between the pressure on the butt bones, the pressure on the pubic bone, and the overall stretch, the nerves get injured and you may start to feel numbness in your penis. You may also feel it in your scrotum and even behind your scrotum, in the perineum. In some cases you may have trouble feeling your urine pass.

The more you ride, the more likely you are to get this numbness. It's like sitting on a toilet seat too long and having your legs go numb. Up to 70 percent of competitive cyclists have complained of this.[11] It is usually a temporary annoyance, lasting hours to days, depending on how intensely you are riding. Every now and then, a biker will get a nerve injury that takes months or years to heal. In a small percentage of men there can be a loss of erections and sexual enjoyment. When the bike seat is pinching the nerves, it is also pinching the arteries that pump blood to the penis. In fact, the bloodflow to the penis drops by 70 percent![12]

Decreased bloodflow to the penis during bicycle riding can result in erection problems later because the tissues inside the penis don't like getting suffocated like that and the cells react by

making more collagen, which is hard, like scar tissue, and doesn't stretch very well. As a result, the penis can become less able to stretch and fill with blood, which is what an erection is all about. These changes are gradual and may sneak up on you. A study of bicycle cops showed that all of the policemen in the study experienced an abnormal decrease in their erections while they were asleep even though they did not notice erection problems when they were awake and trying.[13] For most casual bike riders, nerve and blood-flow problems are not an issue, but the more you ride, the greater the risk. An analysis of men from various walks of life did show improvement in erections with moderate riding, likely due to the general exercise benefit to the heart and blood vessels, but once men rode more than 3 hours a week, a gradual drop-off began. The most at risk are competitive riders, with up to 24 percent developing erectile dysfunction.[14] About 13 percent of amateur riders will have trouble.[15]

Fortunately, there is a fix. Newer bicycle seats have been designed that take the pressure off—somewhat. These are split seats with no nose or a downward-pointing nose, which takes pressure off the pubic bone. Even so, some men are built so that the nerves and blood vessels still get pinched on the butt bones that sit on those split seats. If you still feel numbness, then go for a more padded split seat. Also, riding in a standing position keeps the pressure off and improves bloodflow. Taking frequent breaks to take off the pressure and restore bloodflow is a good idea if you are getting symptoms. Another option is to ride a recumbent bike, which doesn't put any pressure on the nerves or arteries since you don't lean forward. If you find after a hard ride that you go soft, give bicycling a rest and later, you will typically be able to get back in the saddle (and get back in the *other* saddle).

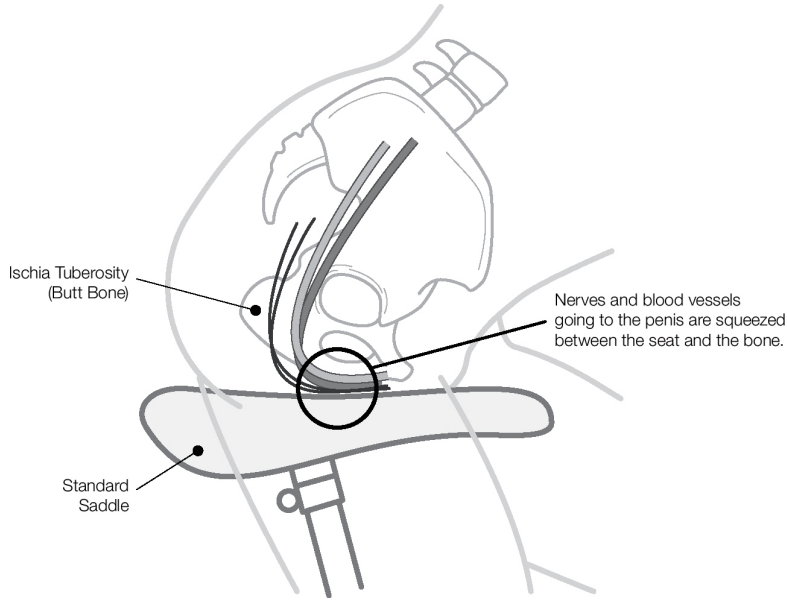


Figure 1 How bicycle riding can affect the nerves and arteries to the penis

Sexercise

So how fit do you have to be to have sex? Can sex be dangerous if you have a weak heart? The answer is that sex is almost never too much for anyone's heart. In fact, less than 1 percent of sudden deaths due to heart attacks are due to sex![16] Even if you have had a heart attack and are a higher-risk heart patient, the risk is only barely higher than 1 percent (besides, there are worse ways to go). When scientists measure exactly how much energy it takes to have sex they use a measurement called a MET, which stands for "metabolic equivalent" of energy expended. When a person is running a treadmill stress test to see how strong his heart is, he may expend up to 13 or 14 METs, but when he has sex, the energy expended is more like 2 to 4 METs, about the equivalent of walking up two flights of stairs. (According to my wife, it's like I use the elevator.) Now, this does not apply to the acrobatic sex depicted in porn and perhaps attempted by honeymooners and show-offs. But for the vast majority of us, sex is not the workout we may think it is. The energy expended during orgasm adds an extra MET or two, depending on the

intensity. Younger folks will tend to steam up the windows a bit more than older folks. If you are into energy conservation, you can drop a MET when your partner is on top. Heart rates seem to peak at about 130 beats per minute for an aggressive missionary, but drop down to 110 when you are lying back and enjoying the show.[17]

Workouts for Your Willy

The penis is not a muscle, but it is largely surrounded by muscles that spring into action during sex, and these can be exercised to a degree. There are muscles at the base of the penis that squeeze during orgasm and help to propel the semen during ejaculation. They go by the names *bulbospongiosus muscle* and *ischiocavernosis muscle*. These muscles are at the base of your pelvis, between the back of your scrotum and your anus, an area officially called the *perineum* but commonly referred to as the *taint* "('tain't your balls and 'tain't your ass). When these muscles squeeze, they also compress the blood chambers of the penis at its base and make the pressure in the erection spike, causing the visible "throb" of an erection. The compression also helps keep the blood trapped in the penis so it doesn't leak out the veins and deflate the erection. It turns out that if you strengthen these muscles, you can actually reverse erectile dysfunction, if not prevent it.

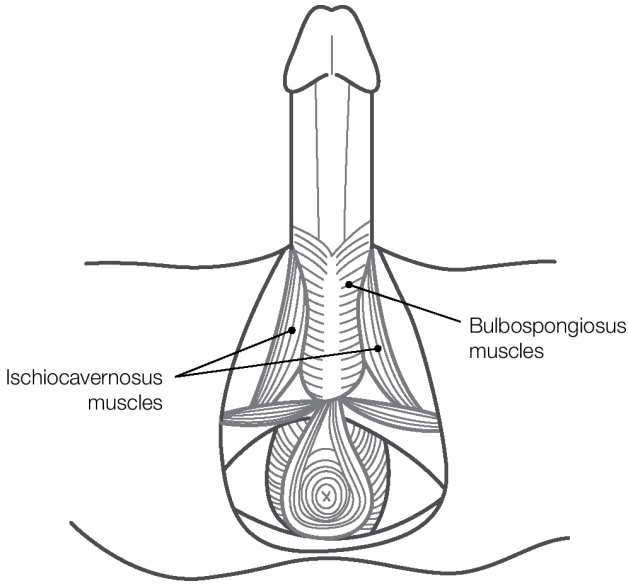


Figure 2 Pelvic muscles that cause ejaculation

Kegel Exercises

You can work out your sex muscles with special exercises called Kegel exercises. Kegel exercises consist of voluntarily squeezing these muscles. The squeeze is basically the movement you make when you are trying to stop yourself from having a bowel movement or from peeing. When you are doing a Kegel squeeze, avoid using other muscles such as your abdominal muscles or your gluteus maximus (butt muscles.) After all, you wouldn't do an abdominal crunch if you were trying to hold in your poop. Squeezing your butt muscles doesn't hurt anything, but it distracts you from feeling and focusing on the target muscles in your perineum. If you stand in front of a mirror when you do Kegel exercises, you should see your penis pull in and lift slightly at the base. Studies have shown that some men get the same benefit from 3 months of Kegel exercises as they do from Viagra![18]

The Kegel is a stealth exercise. When you are doing it right, no one but you can tell. You can do Kegel exercises anywhere, anytime, in front of anyone—and only you will know. There are many variations on Kegel workouts, but one of the simpler ones is to hold for 10 seconds, then release slowly for 10 seconds, then

repeat. A good workout would be three to five sets of 10 reps each over the course of the day. You can also do short 1- to 2-second squeezes more frequently, and you can see how long you can hold one long squeeze. Perform these exercises first standing, then sitting, then lying on your back, then on all fours. You can mix it up. Hey, it's your pelvis—have fun!

In addition to greater erection strength, other benefits of doing Kegel exercises can be greater control during sex and possibly a more intense orgasm or ejaculation. In a study of men who had premature ejaculation, the men were taught to do Kegel exercises, along with biofeedback sessions with a pelvic physical therapist in which special probes allowed them to really isolate the feeling of their Kegel muscles (yeah, you know where those probes went). These men went on to have better control and keep from ejaculating as quickly.[19] The idea is that because these men were more familiar with the way their perineal muscles feel when they contract, they could feel when there was mounting tension and deliberately relax those muscles to prevent the onrush of the climax and ejaculation. Another strategy is to contract those muscles strenuously just before reaching the point of no return as way of "rebooting" them before the unwanted contraction rushes on.[20]

As far as intensity of orgasm and ejaculation, scientists have determined that part of the pleasure a man feels during ejaculation is from the pressure created in the base of the urethra when the sex muscles are squeezing it. These squeezes during ejaculation are not under your voluntary control, they are a complex reflex, but some claim that one can enhance the intensity of the ejaculation by voluntarily squeezing these muscles as well. It's like deliberately kicking harder when the doctor taps your knee with the little hammer. Does it really work? Well, try it and find out.

Kegel exercises are good for your partner too. For women, strengthening the targeted muscles can increase the tone or tightness of the vagina. They surround the vagina as it passes through the pelvic floor, holding it in place. The added tone in these muscles may enhance a woman's orgasm intensity because, just as in a guy, these muscles squeeze during her climax. Other benefits of strengthening the pelvic floor muscles with Kegel exercises include preventing accidental urinary leakage

(incontinence), which might happen when someone coughs or sneezes or even just rises to a standing position. Stronger pelvic muscles can also keep a woman's uterus and rectum from dropping. These muscles do weaken over the years due to age, childbirth, excess weight, and gravity, so the sooner a person starts, the better.

CHAPTER 16

MY FIVE-STEP PLAN FOR MAXIMUM PENIS HEALTH

Get Pumped Up!

Are you ready to take a stand? Are you ready to get pumped up? Are you ready to work hard and play even harder? Then you are ready for maximum penis health!

I have devoted my entire professional life (and a good part of my private life) to promoting penis health, culminating in this five-step plan to provide you with the essential tools you need for your tool.

Step 1 is all about the four-letter word that's on the tip of everyone's tongue. That's right: F-O-R-K. What you eat affects the health of your heart and the blood vessels that pump blood to the penis. The key to a man's heart truly is his stomach, and the key to a man's penis is his heart. Step 1 will teach you the proper diet for your dick.

Step 2 steps it up with sexercise. When you exercise, your blood vessels release chemicals that strengthen the health of your penis. Although it's not a muscle, your penis is surrounded by muscles. Step 2 gives your willy a workout that keeps you going strong and coming even stronger.

Step 3 is going offline. Your big head is connected to your little head, and the sensations and images that enter your brain from streaming pornography actually can make Mr. Happy not so happy and even confused after a while. Step 3 will help you keep both of your heads on straight.

Step 4 is detox. Drugs, alcohol, and certain medications, including steroids, can leave you hanging. Get the hard facts on how what you put into your body affects your hardness.

Step 5 is all about how you snooze or loose. Mr. Happy needs sleep, or he becomes Mr. Grumpy. Uninterrupted sleep is important for the health of your nerves, blood vessels, and testosterone production—all of which are critical for maximum penis health. Get some shut-eye if you want *your* thing to go bump in the night.

Step 1: Go Fork Yourself

Maximum penis health begins with maximum nutrition, and *that* begins and ends with what you choose to stick your fork into. You are what you eat, and so is your penis. (I eat a lot of big cucumbers.)

Although no food will instantly give you a boner (aside from chocolate-covered Viagra), there are foods that will either keep your cucumber fresh or pickle it. The key to eating for your penis is eating for your circulation. The penis is all about bloodflow, and what science has taught us is that the key to bloodflow is an amazing molecule called nitric oxide. The chemical formula is NO (nitrogen and oxygen), which is easy to remember. This amazing molecule not only makes your penis arteries open like garden hoses, it actually nourishes and strengthens them. NO is made by healthy foods, and it's actually destroyed by unhealthy foods. Every time you choose to eat something, just say NO! Ask yourself—is this food boosting my NO or is it blocking my NO?

Eat Good Food

So how do you know what to eat? There are so many diets and so many experts to take advice from (including me, but I really *am* an expert!).

Fortunately, eating well is not complicated. All the good NO-boosting food has been grouped together in one special place in the grocery store where it's easy to find. It's called the *produce section*. Vegetables, fruits, beans, nuts, and whole grains are all NO boosters. Some boost NO more than others. Some are better raw, others better cooked.

Now, I could tell you, eat such-and-such vegetable and such-and-such fruit prepared in such-and-such a way, like so many cookbooks and blogs circulating around out there, but that's not

really necessary. You can keep it simple. Eat a lot of different kinds of produce. Eat green—especially leafy greens—eat red, eat orange, eat purple. Mix it up and make a meal of it.

Each unique vegetable, fruit, bean, nut, or grain has its own special blend of molecules or phytonutrients that do good things to your body. They go by the names of polyphenols and flavonoids, and there are literally thousands of them. They usually work best when they are kept in their natural state, as they occur in a *whole* fruit, vegetable, nut, or grain.

When you go to the grocery store, just head for the produce section. Avoid the boxes and cans and wrappers. And when you are in the produce section, imagine you are standing in front of a big medicine cabinet—only this medicine doesn't have side effects, and you can't overdose.

It's also important to chew your food. In this fast-paced world, smoothies and juices get you out the door, but you actually need to slow down and chew, just like your mom told you to. It turns out there are bacteria hiding out in the crevices on the back of your tongue that must react with your saliva in order for you to absorb the NO you need. And chewing makes you salivate.[1] Blending also breaks down the fibers in fruits making it easier for you to absorb more sugar than you would if you just ate them.[2]

Skip the Not-So-Good Food

There is mounting evidence that populations that eat a lot of animal products have higher rates of blood vessel disease. It's not just the fat, and it's not just red meat. Any animal protein, including eggs and milk, can have this effect.[3] Other diseases and cancers seem to crop up with high animal product consumption, including prostate cancer.[4]

Cutting out the prostate often hurts Mr. Happy, so block that surgeon's knife with your fork.

There are some great resources out there on the reasoning behind moving to a plant-based diet, including *The China Study*[5] and *In Defense of Food.*[6] And cutting out the meat doesn't have to mean cutting out the taste: There are plenty of tasty ways to incorporate more natural foods into your diet.[7]

And keep in mind, if going vegan or vegetarian isn't your thing, you can still reap the benefits of a mostly plant-based diet

by significantly cutting down on your meat intake and focusing on those friends we found earlier in the produce aisle.

What about the Mediterranean diet? The secret is not the olive oil. That's because no oils have really been proven to be healthy. Whether you consume olive oil or soybean oil or palm oil, within a few minutes your NO production plummets and your bloodflow slows down. This effect lasts up to a few hours, just in time for your next meal…and then your next meal…and so on.[8]

The key to the Mediterranean diet is really all the fresh produce that goes along with it. In fact, it turns out that vegetables have a protective effect against the harmful effects of fats or excess animal proteins when you eat them together. They act like a shield, blocking the harmful effects and keeping the NO levels up and the circulation humming along. If you don't want to be a vegan, at least eat as many vegetables as a vegan.[9]

Sugar and spice and everything nice is not what little boys are made of, and that's because sugar is the enemy of the penis. I'm not talking about a little whipped cream on top or edible underwear; I'm talking about all the sugars and simple starches hidden and not so hidden in most of our foods. They cause a surge of toxins in your bloodstream that suppress your NO and injure your blood vessels. They also jack up your insulin, which then stores the sugar away as fat. The fat then releases toxins into the blood that also knock out NO and damage and narrow the blood vessels. Eventually, you may run out of insulin and become diabetic, making your blood vessels even worse and making your lollipop flop.[10]

Fruits and vegetables *do* have sugar and starch in them as well. But the fiber keeps these naturally occurring sugars and starches bound up and harder to absorb when you eat them. And that's not even counting all the good, healthy effects the other phytonutrients in the fruits and vegetables are giving you at the same time.

Avoid Additives

There's no end to the list of additives food scientists have concocted to flavor, color, texturize, and preserve the food we eat. One in particular deserves special mention: phosphates. Phosphates are found in dark colas and throughout a wide variety

of packaged and processed foods. Elevated levels of phosphates cause the smooth muscles in your arteries to change into bone cells, becoming calcified and hardening, leading to erectile dysfunction and eventually cardiovascular disease.[11]

Phosphates are everywhere, and they don't always get listed on the label. They are in popular breakfast cereals, and they are in processed meats. They are in coffee creamers, and they are in flavored waters. They go by many names, such as phosphoric acid, disodium phosphate, and tricalcium phosphate. But usually, hidden somewhere in there is the root word *phosphate*.[12]

Phosphates occur naturally in plants but at much lower levels and packaged in a complex way so that they do not affect your circulation in the same devastating manner. Rule of thumb: If it's in a wrapper, box, or can, think twice about putting it in your mouth.[13]

Grab These Good Cheats

Don't despair! It's not all kale and Brussels sprouts. You can do well with some guilty pleasures that aren't so guilty after all. Chocolate and wine, for example, are actually chock-full of good flavonoids. They boost NO and a whole lot more that we are still discovering: A recent study revealed that chocoholics reduced their risk of heart disease by a whopping one-third, as compared to those who only ate chocolate now and then.[14] The cocoa is the key, not the sugar or the milk. In fact, a study found that milk chocolate or milk drunk with dark chocolate decreases the levels of flavenoids and antioxidants that the dark chocolate alone can boost.[15]

Red wine appears to promote the health of the blood vessels as well.[16, 17] This is likely another key to the benefits of the Mediterranean diet. The fermentation of the grapes brings out lots of great flavonoids that boost NO. The alcohol is not really the secret sauce.

Of course, everything in moderation, because if you imbibe too much alcohol you will end up with "whiskey dick," and the only hard thing you will be holding is your liquor.

There Is No Magic Bullet

There is no substitute for fresh, whole, plant-based foods to boost your NO for maximum penis health. Nonetheless, we are a pill-popping culture, and there's no shortage of supplements that claim to jump-start your johnson.

There is very little science behind the vast majority of these products, but a few have been studied. As with food, go for the supplements that boost NO. (Chapter 5 breaks the more popular supplements down by possible, if not proven, effects.)

5 Colors of Phytonutrients

Red Benefits

Supports prostate, urinary tract, and DNA health. Protects against cancer and heart disease.
Phytonutrients: lycopene, ellagic acid, quercetin, hesperidin, anthocyanidins

Purple Benefits

Good for heart, brain, bone, arteries, and cognitive health. Fights cancer and supports healthy aging.
Phytonutrients: resveratrol, anthocyanidins, phenolics, flavonoids

Green Benefits

Supports eye health, arterial function, lung health, liver function, and cell health. Helps wound healing and gum health.
Phytonutrients: lutein/zeaxanthin, isoflavones, EGCG, indoles, isothiocyanates, sulphoraphane

White Benefits

Supports healthy bones, circulatory systems, and arterial function. Fights heart disease and cancer.
Phytonutrients: EGCG, allicin, quercetin, indoles, glucosinolates

Yellow Benefits

Good for eye health, healthy immune function, and healthy growth and development.
Phytonutrients: alpha-carotene, beta-carotene, beta cryptoxanthin, lutein/zeaxanthin, hesperidin.

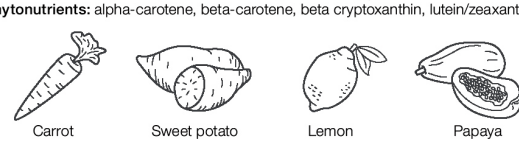


Figure 1 Eat lots of different colors, shapes, and sizes of food.

Step 2: Sexercise

Maximum penis health means maximum penis fitness. Your heart pumps blood to your penis. They are in this game together, so train hard to play hard. A strong heart and clean blood vessels will keep you properly pumped for years to come.

Get off the couch if you want to have more fun in the bedroom. Inactivity actually increases your risk of becoming impotent by 10 times.[18] Being sedentary also causes you to accumulate toxins in your blood that destroy NO.[19] Furthermore, it leads to obesity, and the fat cells also create toxins that sap NO and cause your bloodflow to deteriorate.[20, 21] Exercise and weight loss go hand in hand if you eat right (see Step 1). Exercise clears your blood of inflammation and toxins and it stimulates your tissues to release more NO, which increases bloodflow to the penis.[22]

Regular exercise has been proven to prevent and reverse erection problems. The more you put in, the more you get out (and then get to put in). Studies show that moonlit walks are nice, but actual vigorous exercise at least a few days a week are even better for erections.[23] Is it possible to exercise too much? Maybe. Extreme endurance athletes may push their bodies so hard that they actually cause inflammation, and the extreme physical stress may lower their testosterone.[24]

Sometimes exercise actually hurts Mr. Happy. It's uncommon, but for some men, bicycle riding can take them out of the saddle. A small percentage of guys just aren't built right for standard bicycle seats, and when they sit on one, the nerves—and, in some cases, the blood vessels to the penis—get squished. You may have noticed after a long ride that your nub is getting a bit numb. Usually it's a temporary annoyance, and a change in bicycle seats to a split saddle with extra padding does the trick. But for avid cyclers, it can be more than that. About 1 in 4 competitive cyclists actually develops a problem with erections.[25] So if you experience repeated numbness or problems with your erection, don't try to put a positive spin on it. Shift gears and switch to a recumbent bike or another workout that takes the pressure off.

And now: Sexercise *for real*. There is an actual exercise that can pump up your pumper. Although the penis is not a muscle, it is surrounded by muscles in your pelvis. They have awesome names like *bulbospongiosus* and *ischiocavernosus* (much cooler than *abs* or *quads,* don't you think?). These muscles squeeze the base of the penis, which reinforces the erection by preventing venous leakage and increasing the pressure inside the pumped-up penis chanbers. It's that squeeze that makes it throb. This boosts your pud to stud-level hardness. These muscles contract as a reflex

during sex, but you can also work them out with specific squeeze maneuvers called Kegel exercises. The squeeze is simply the movement you make when you are trying to stop yourself from having a bowel movement or from peeing. It's not squeezing your butt or crunching your stomach. If you stand in front of a mirror when you do it, you should see your penis pull in and lift slightly at the base. Or if you do it with an erection, it should rise up to salute you with each squeeze. Studies have shown that some men get the same benefit from 3 months of Kegel exercises that they do with Viagra.[26]

The great thing about Kegel exercises is you don't need a gym. It's true that you can see a pelvic physical therapist for some personal training to get even better results, but you can also do these exercises anytime, anyplace, and no one will know.

The basic workout is squeezing for 10 seconds, releasing for 5 to 10 seconds, and then repeating. Try for 5 to 10 reps, three to five times a day. You can do short bursts of squeezes and long, sustained holds. Perform these exercises first standing, then sitting, then lying on your back, then on all fours. Mix it up and have fun with it. Own your pelvis!

Besides developing a "boner of steel," the other benefits of doing Kegel exercises can be having greater control during sex, lasting longer, and possibly experiencing a more intense orgasm or ejaculation. This may be a fix for premature ejaculation because, as you get more familiar with the sensations of those muscles squeezing when you are not ejaculating, you can deliberately relax them before you cross the point of no return or, alternatively, you can deliberately squeeze them hard before the reflex hits—sort of like distracting yourself from something that hurts one place by pinching yourself in another.[27]

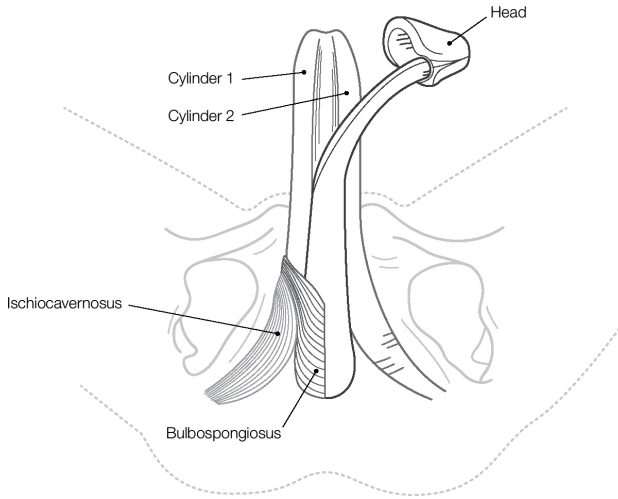


Figure 2 Pelvic muscles

Step 3: Go Offline

Smartphones and the streaming Internet put the world in the palm of your hand. And 1 in 4 online searches is for porn, which can lead to your dick in the palm of your other hand. There have been more than 150 billion downloads of pornography worldwide, with an average of more than 350 per smartphone.[28] We are adrift in a digital sea of sex, but like the real ocean, it's a case of water, water everywhere and not a drop to drink. Instead of turning you on, all this porn is slowly tuning you out. Your brain on porn is like your brain on drugs. Studies show that the prefrontal cortex, the same center of the brain that causes addicts to seek drugs, can cause you to seek porn.[29] What's the big deal? The problem is burnout. And I don't mean carpet burns—I mean burnout of your sexual drive and, ultimately, your best buddy.

There is a brain center that drives the desire to see something new or different when watching porn. It's called the *dorsal anterior cingulate cortex*. If you watch a lot of porn, this part of the brain pushes you to stream more—and different—stuff. All the while that brain center becomes less sensitive, and to satisfy it, you have to keep ratcheting up the hardness of the hard core.[30] After a while, you can't buy a thrill. Real partners don't come close, and even hard core leaves you soft. In some cases, you'll find yourself clicking on content that you actually find disgusting,

but at least it's something new. The part of your brain that is responsible for romantic love, known as the *right caudate of the striatum*, nestled underneath the thinking cerebral cortex, actually shrinks over time with high-volume porn exposure.[31] And even if you aren't a romantic, you still suffer. The *putamen*, another deeper brain structure that sends the signals to actually make you hard, powers down with more and more porn.[32]

Since the advent of Internet streaming "porn tube" sites, there has been an epidemic of impotence in young, healthy guys—even teenagers! Desire for sex has plummeted, and more and more guys are left high and dry—unable to reach a climax or ejaculate. As of 2014, over half of college-aged men reported being exposed to Internet porn prior to age 13, which was over triple the amount just 6 years earlier.[33] By now, more than half of boys are exposed to porn by age 12.[34] One-third of men under 40 now have ED and low sexual desire, compared to 2 percent prior to the streaming porn spike.[35] Don't it make your brown balls blue? In the age of streaming porn, 25 percent of young guys ages 16 to 21 have erectile dysfunction and low desire, and more than 10 percent have trouble ejaculating. These troubles are directly correlated with how much porn they are watching.[36, 37] The younger a kid is when he sees porn, the greater the chance he won't enjoy sex when he gets older.

The problem isn't just with the young and the restless, though. Married guys looking to spice it up find that the more they log on, the less their log goes in. Surveys of married couples revealed a sharp drop in sexual satisfaction and marital bliss when husbands had a lot of lusty links on their Internet histories.[38, 39]

Another problem with porn is the unrealistic standards it sets for your own penis. The typical porn star is by no means typical. The average porn penis starts at a couple inches bigger than the average penis, which stands about 5½ inches tall. Also, the supersex scenes are about five times longer than the average 5 to 7 minutes in heaven most couples enjoy. (Not to mention they typically take about 4 hours to shoot!) About a third of regular porn watchers with normal penises believe theirs is too small and sell themselves short.[40] Almost half of guys who want penis enlargement surgery do so because porn made them feel small.

So guys, and you know who you are, give yourself some credit. You are perfectly normal; porn is not.[41]

If you want maximum penis health, you need to minimize the porn. Your biggest sex organ is your brain. And more than thoughts are bouncing around in there. Actual on/off signals to the penis start there, and they can be physically short-circuited.

The good news is, even if you have gone to the dark side and you are having trouble with your light saber, the Force can once again be with you. Your brain is amazingly resilient, and if you give it some time, it will bounce back. If you are suffering from the effects of porn, the best thing to do is quit cold turkey. The worst that will happen is you will just get bored, but then eventually you will get the thrill back. There is case after case of pornaholics whose relationships were in the toilet, along with a lot of tissues and hand lotion, who got that loving feeling back after a few weeks to months of keepin' it real.[42] Cognitive behavioral therapy, as well as couples therapy, has also been shown to be effective.

Step 4: Detox

When you are young and seemingly indestructible, it feels like there's nothing you can't do, and your penis is there by your side —er, front—ready for anything. But that doesn't last very long if you are like most mere mortals. Sooner rather than later, poor lifestyle choices or increasing illnesses and mounting prescriptions take their toll. I don't have to tell you that your penis is like a dipstick, but it really *is* like a dipstick in that it can tell you when you are running clean or when you're getting sludgy, and it's time for a change.

One of the worst poisons for your penis is a cigarette. Long depicted as sexy, the cigarette has finally been revealed for the poison stick it truly is. The toxins in the smoke don't just choke your lungs, they get into your bloodstream and damage your blood vessels. These free radicals not only directly attack the walls of the blood vessels, they shut down your precious NO. Cigarettes cause your arteries to harden and form plaques and even your blood to clot. The more you smoke, the less you will poke. Throw in some high blood pressure or some diabetes, and you might as well just cut it off now. Oh, and choose your friends wisely, because secondhand smoke chokes your chicken too.[43, 44]

The ravages of cigarette smoking can be reversed, but slowly

and only to a degree. You can see improvement in as few as 8 weeks, but even if you quit your overall risk of having ED is higher, so it's best to not even get started.[45] The US Department of Health and Human Services[46] and the National Cancer Institute[47] have some great resources to get you started down the road to freeing your willy from that smoking addiction.

Excess alcohol is a downer, too. A glass of wine can relax you and get your juices flowing, but turn that bottle's bottom up, and you may have to turn down another bottom later on. Alcohol is a depressant. As your blood alcohol levels rise, your sexual arousal actually drops, and you may even find it harder to climax. Too much, too often catches up with you. Aside from the morning-after regret of beer goggles or the heartbreak of whiskey dick, if you really overdo it you can damage your liver, which boosts your body's estrogen levels. This shuts down your testosterone and kills all that courage you thought was in the bottle.

Alcohol is also a nerve toxin, and too much can destroy the nerves that stimulate your penis. As if that weren't enough, excess alcohol also knocks out the NO in your blood vessels, directly hurting the blood-flow to your penis.[48] Half of all alcoholics suffer from erectile dysfunction.[49] It may sound like a cliché, but if you're having trouble letting the bottle go, programs like Alcoholics Anonymous can get you back to sober and sexy.

Marijuana use is a tricky subject. The science is limited, and the studies aren't nearly as clear-cut as with cigarettes and alcohol. Some studies conclude that chronic users get blunted by all that blunt,[50] but others are not convincing. There are sex centers in the brain that may be switched on by marijuana, but others are switched off. Experiments indicate that marijuana slows the flow of blood to the penis. Some studies show stoners' testosterone can get smoked, while other studies fail to find a smoking gun.[51]

For other drugs, though, the connection is a lot clearer. Opioid pain pill abuse is at epidemic proportions. So is heroin use. These are all narcotics, and if you are a junkie, your junk will suffer. All narcotics—pills, shots, patches—if taken long enough eventually shut down your testosterone, killing your desire, your erections, and your ability to reach that ultimate high—a climax.[52] Cocaine, amphetamines, and ecstasy, often used to enhance sex, eventually result in higher rates of erectile dysfunction, lower levels of

pleasure, and difficulty reaching climax.

Quitting the drugs can restore sexual health, but not always back to its previous level. Up to 25 percent of long-term users may suffer sexual side effects even after a year on the wagon.[53]

Some drugs you have to take. But medications that may help you live may also make you die in bed. Up to 25 percent of drugs don't get along with your penis. The most common culprits are blood pressure medications. Since they lower the pressure, less blood is getting pumped to those faraway places like your penis. Some of these medications also interfere with the brain centers and nerves that switch on bloodflow to your penis. Others interfere with testosterone production. Antidepressants can make you happy but leave Mr. Happy sad. Propecia keeps your hair full, but it may thin out your penis. Meds for serious illnesses, including HIV and hepatitis, lower testosterone—but, of course, the trade-off is necessary.

The best way to avoid the sexual side effects of prescription drugs is to avoid getting sick enough to need them with good diet and lifestyle choices. But sometimes you can't avoid taking meds, and fortunately, in most cases, there is a workaround with medications like Viagra and with testosterone replacement if needed.[54]

Step 5: Snooze or Lose

This step is so easy you can do it in your sleep—because it *is* sleep. Sleep causes your testosterone to surge, and it promotes healthy nerves and circulation to your penis. Lack of sleep leads to problems with sex drive, erections, and even orgasm.

And sex isn't the only thing that suffers. Sleep is critical for your health in many ways we are only beginning to understand.

But getting a good night's sleep may not be so easy after all. We live in a 24-hour society. From headlines to deadlines to 24/7 stores, the constant demands for your attention, your productivity, and your money squeeze more and more hours out of you each day and each night. You may think of sleep as a luxury, but it's really a necessity, especially for maximum penis health. While you sleep, your body surges with testosterone, the male master hormone that stimulates your brain to want sex and ensures your penis is ready for it. As you begin to dream, the

brain sends a signal to your testicles to ramp up the testosterone production. If you don't get enough sleep, you may not make enough testosterone.

Table 1: Sleep Recommendations by Age

AGE	HOURS NEEDED	MAY BE APPROPRIATE
Newborn to 3 months old	14–17 hrs	11–19 hrs
4 to 11 months old	12–15 hrs	10–18 hrs
1 to 2 years old	11–14 hrs	9–16 hrs
3 to 5 years old	10–13 hrs	8–14 hrs
6 to 13 years old	9–11 hrs	7–12 hrs
14 to 17 years old	8–10 hrs	7–11 hrs
Young adults (18 to 25 years old)	7–9 hrs	6–11 hrs
Adults (26 to 64 years old)	7–9 hrs	6–10 hrs
Older adults (65+)	7–8 hrs	5–9 hrs

After even just a few nights of sleeping 5 hours or less, testosterone can drop significantly. The impact on T is equivalent to aging about 10 or 15 years.[55] At least 15 percent of the American workforce gets under 5 hours of sleep a night. Up to a third of night shift workers just can't get to sleep properly, and a significant percentage of them may lie awake while Mr. Happy refuses to get up.[56]

Lack of sleep can also lead to depression, which kills your libido and your erections—as can the medications required to treat depression. It's a vicious circle.

Sleep isn't just important for Mr. Happy, though. It's important for Mrs. Happy too. Better sleep improves sexual interest, arousal, and lubrication in women.[57]

The crazy and potentially dangerous thing is that if a guy is sleep deprived for just one night, he may incorrectly perceive a woman to have more sexual interest and willingness to have sex than she actually has. The lack of sleep fogs his judgment the same way alcohol does.[58] Think sleep goggles.

Millions of men have sleep apnea, a condition of snoring that is so severe, it actually chokes off their oxygen several times a night, interrupting their sleep. Having sleep apnea is like getting

strangled in your sleep several times a night, every night, but not knowing it. Sleep apnea can ruin your sex life.[59] Not only does the sleep interruption lower your testosterone, but the lack of oxygen shuts down NO and can damage your blood vessels and nerves, hurting the penis itself.[60, 61] Even though you sleep through it, your body is under extreme stress, releasing adrenaline, which is the very signal that shuts down erections when you're awake and anxious.

Sleep apnea can also increase your risk of high blood pressure, heart disease, diabetes, and obesity.[62] If you snore a lot—and especially if you feel tired during the day—consider getting evaluated by a sleep specialist who can test you for sleep apnea. If you have it, you can be treated successfully, often with a device called a CPAP (continuous positive airway pressure) machine with a mask you wear when sleeping to increase the flow of air into your lungs. Or sometimes weight loss alone can do the trick. One thing's for sure, though: Guys with ED who treat their sleep apnea definitely have more fun in bed when they aren't sleeping.[63]

Maximum penis health requires a minimum of 7 to 9 hours of sleep for most guys, even more if you are a teenager. You can't make it up on the weekends, either; your body doesn't work that way. Power naps are great the day after a long night, but they don't allow the same production of testosterone your penis relies on. If you're not getting the *Z*s you should, try the following tips from sleep.org.

- Avoid bright lights and screens beginning about an hour before bed.
- Keep your bedroom as dark as possible.
- Get back on schedule by going to sleep a few minutes earlier every night until you're back to your regular bedtime.
- Try taking melatonin, which can also help you doze off at the right time.
- Avoid eating, drinking, and exercising right before you hit the hay.[64]

Summary: The Five-Step Plan to Get Your

Penis Pumped

So now that you have the long and the short of it, what are you waiting for? Get your penis on this plan to get it pumped up in no time. And remember, you don't have to hit all five steps at once. If the thought of all that work is making your willy wither, try implementing one step per week or even one step per month.

Step 1	Go fork yourself.	Eat foods rich in nitric oxide, aka produce.
Step 2	Sexercise.	Do some vigorous exercise two or three times per week, plus Kegel exercises three to five times per day.
Step 3	Go offline.	Turn down your exposure to porn—go cold turkey if you can.
Step 4	Detox.	Cut back on addictive substances such as cigarettes, alcohol, and drugs.
Step 5	Snooze or lose.	Improve the quality and length of your sleep, aiming for 7 to 9 hours per night.

PART THREE

The Dick Doc Explains Penis Problems

CHAPTER 17

GETTING BENT OUT OF SHAPE: Peyronie's Disease

"How's it hangin'? A little to the left? Or perhaps a little to the right?" A little is okay, but a lot…not so much. Peyronie's disease, a poorly understood condition of the penis, causes up to 10 percent of men to literally get "bent out of shape."[1] Although this "disease" is not life threatening nor does it lead to any other ailments, it can be devastating to the man and his partner as it can render the penis so angled, twisted, or indented that sexual relations become impossible. Sometimes the condition is genetic, sometimes it's related to an injury, but in most cases it seems to just be bad luck. The older you get, the more likely you are to develop it, but it can affect both younger and older men. This disease is rumored to have been the hallmark of a certain leader of the Free World, according to a certain intern who wore a certain blue dress.

Peyronie's disease is actually named after a French 18th-century physician named Francois Gigot de la Peyronie, who himself had the condition. As a young student, he would sneak into the dorm rooms of his classmates with a protractor and measure the angles of their morning wood before they awoke.[2] We still use protractors to measure the penis to this day, but usually with the patient awake and in the doctor's office. This chapter explores what is known about Peyronie's, as well as what can be done. Pills and supplements usually don't help, but a variety of injections have been tried. Mechanical traction devices can help, but surgery has been the most reliable treatment for this strange syndrome until the very recent introduction of an FDA-approved injection called Xiaflex. Less commonly available treatments run the technological gamut, from the administration

of acoustic shock waves or electrical current to the penis to the injection of stem cells.

What Is It?

Peyronie's disease is not really a disease in the sense of a malady that holds you in its grip, draining your life force, unless you are a penis—then yes, by all means, it's a bad deal. Peyronie's disease is not an infection and it's not a cancer. It's actually an imbalance. The linings of the chambers of the penis that fill with blood are made of tissue that is both strong and flexible, consisting of molecules that stretch like elastic (called *elastin*) intermixed with molecules that are tough, called *collagen*. There is a delicate balance in the organization of these two molecules, but Peyronie's disease causes them to become disorganized into a nodular mishmash.[3] As a result, the affected part of the penis chambers cannot stretch like the rest of the chambers and so the penis kinks at that point, making the erection bent, twisted, or indented—sometimes all three. This nodule is called a *plaque.* It has nothing to do with dirty teeth or your coronary arteries; it's a different kind of plaque. It is simply a buildup of disorganized tissue. The plaque may create a very obvious lump in the shaft or be hard to feel but still cause a bend in the erection. Sometimes calcium deposits will build up on the plaque, making it even harder and more irregular. The plaque most often arises along the top of the shaft, and less commonly, near the urethra. The bend will be on the side where the plaque is building up, and sometimes the location of the plaque will cause a complex bend in more than one direction. The plaque can also cause a narrowing like that in an hourglass, or an indentation on one side or another of the penis.

Peyronie's disease strikes men of all ages, but it's most common in men in their forties and fifties. It's also more common after prostate cancer surgery. Peyronie's comes on very rapidly in some cases and more gradually in others. There is usually pain in the erection for the first several months that gradually goes away. In a small percentage of guys, the whole thing goes away, as if it were just a bad dream. For others, it gets worse, and for most, it stays about the same. The condition may even change for up to 2 years, but more commonly it stabilizes in the first year.

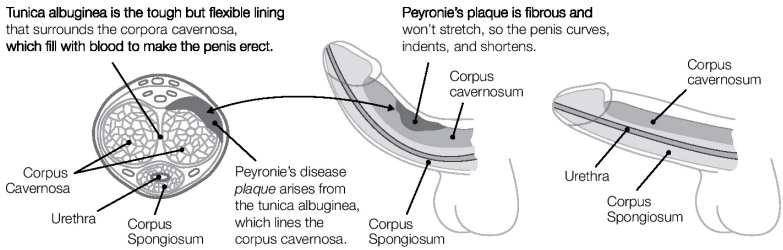


Figure 1 Peyronie's disease is an abnormal thickening of the shaft of the penis.

Why Does It Happen?

Dupuytren's Contracture

One known but uncommon cause of Peyronie's is a syndrome in which other tissues in the body made of a mix of collagen and other molecules go haywire and too much collagen builds up. This is a hereditary condition, and it shows up as nodules and shortening of the tendons in the hands and feet, which are called Dupuytren's contractures. The palm and fingers—usually the third or fourth fingers—won't open all the way. An injection used to treat Peyronie's is also used to treat the tendons in these people.

Trauma

Another known cause for Peyronie's is an injury. If the penis's blood-filled cylinder is injured, the tissue will attempt to repair itself using collagen as a scaffolding until all the other molecules and cells have grown in, but in the case of Peyronie's disease, the tissue makes too much scaffolding and becomes too stiff to stretch properly. It's similar to when a person forms a keloid scar, which is a much larger scar than a skin injury usually forms because the scaffolding of collagen in the skin keeps forming long past what is needed. The penis is hard to injure when it's soft because it usually yields to whatever is bluntly hitting it, so most of the injuries occur during sex, when the chambers that fill with blood are tense and cannot yield. Usually it's a matter of a misplaced thrust or a sudden shift in position with the guy not completely in control. In other instances, if the penis is not fully erect but tough

enough to stuff, it may allow more bending that then leads to an injury. Sometimes it's a matter of "too much teeth" during oral sex. It's possible that a minor injury can occur without much discomfort and so it may go unnoticed, but the tissues are still triggered to make too much collagen. A severe injury would be a penis rupture, which is unmistakable, as the internal bleeding suddenly swells the penis to the size and color of an eggplant. This is an emergency that needs to be surgically repaired. If it's not repaired, there is a significant risk of its healing incorrectly, with excess collagen and curvature and possibly poor erections.

Penis Injections

A commonly used remedy for impotence is self-injection of a prescription medication directly into the penis. The most common medication is called prostaglandin. Other common medications are trimix or quad-mix, mixtures of prostaglandin, phentolamine, papaverine, and atropine. They are injected with a tiny needle, but even so sometimes the needle injury sets off the collagen repair and Peyronie's sets in. This risk is lowered by moving the injection site around so there is less trauma to any one part of the penis chamber. Still, the drugs themselves can cause a chemical reaction in the tissue that triggers Peyronie's. Papaverine causes the most fibrosis, but this effect is lessened when it is diluted with the other ingredients.

Prostatectomy

Many men are cured of prostate cancer by surgical removal of the prostate; however, these men have a greater chance—about 16 percent greater—of developing Peyronie's disease.[4] It's not due to an actual trauma to the penis during surgery but instead may be due to some decreased bloodflow to the penis as a result of nerve injury during surgery. The decreased oxygen levels may lead to more collagen formation in the penis.

Spontaneous Causes

The vast majority of cases seem spontaneous, without any obvious cause. The leading theory is that low-grade damage

occurs during sex, like wear and tear on a shock absorber. More men with erectile dysfunction tend to get Peyronie's and it may be that the penis is buckling a little too much during sex, causing increased strain on the tissue because it is not completely rigid. The tissues of the penis mount a low-grade inflammatory reaction to the tissue strain that normally would enable healing, but the chemicals released by the inflammation, also known as free radicals, damage the tissue further and throw the healing response out of balance. This results in the formation of the abnormal plaque tissue. It can come on surprisingly fast or evolve over a few weeks to months. The chances are higher for men over age 40 and worse if they have erectile dysfunction, diabetes, high blood pressure, cardiovascular disease, or are on dialysis.[5]

Treatments for Peyronie's

It's hard to hit a moving target, so while Peyronie's is still changing, treatment options are limited. Surgery is definitely off the table. It's not a good idea to operate on an area that might change *after* you've already cut and sewn. One legitimate option in the first few months is to do nothing at all, in case this disease goes away on its own. Since in the majority of cases it does not, it's reasonable to take a preemptive strike at it as a means of improving it or at least preventing it from getting worse. The key is to pick a treatment that can be effective without over-treating the tissues that may not need treatment after all.

Pills

The least invasive approach is taking supplements. Unfortunately, supplements rarely do much good as a stand-alone treatment. Vitamin E is commonly recommended, but there is little evidence it actually helps. L-carnitine is an amino acid that lowers the production of free radicals, the toxic chemicals released during inflammation. It doesn't seem effective on its own, but one study showed that it improved the results of injection therapy (described later in this chapter).[6, 7] Another commonly prescribed supplement is Potaba (potassium para-aminobenzoate). It's an anti-inflammatory and antifibrotic agent. A few studies indicate it helps, but it's hard to stick with it since you have to take six pills,

four times a day, and it often causes stomach upset.[8] Another antifibrotic medication, pentoxifylline, may reduce the calcification of newly forming plaques or even prevent plaques if taken right after a penis injury, but evidence that it really works is sparse. Colchicine is a medicine with anti-inflammatory activity that is used to treat gout. It may or may not be effective in treating Peyronie's but often causes stomach upset. There is evidence that nitric oxide (NO) probably plays a role in reducing Peyronie's plaque. Cialis and the other erection pills work by boosting NO in the penis. One study showed that daily low-dose Cialis reduced fibrosis in men with Peyronie's.[9] These medications also help counteract the weakening of the erection that the plaque often causes. Along these same lines, perhaps nutritional supplements that boost NO production may help, even if just a little.

Traction

A good option for early treatment is penile traction. Although it sounds medieval, it is rather effective. The penis is stretched when it is flaccid. This pulls apart the matrix of the plaque slowly and steadily. New, healthy cells grow into the tiny breaks that are created, and the penis gradually straightens. Indentations and narrowings can improve as well. Penile traction devices can be purchased without a prescription and are easily found online. They are often advertised as a way to make your dick bigger, but they don't really, unless by that we mean regaining length that you lost from the Peyronie's disease. You put your penis in the "rack" for 2 hours at a time, with a 20- minute break in between stretches. It's necessary to use the device at least 4 hours a day, and up to 8 hours, in order for it to be effective. Collagen is very tough tissue and must be remodeled slowly but steadily. As time goes on, you gradually lengthen the traction device as your penis lengthens. The gains are usually accomplished over a 6-month period of daily use.[10, 11]

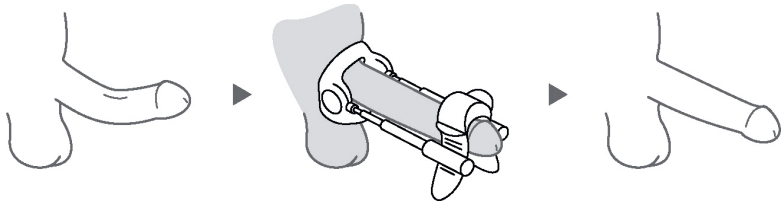


Figure 2 Using traction to treat Peyronie's disease

Injections

A few different injections may break down the Peyronie's plaque even if they do not completely dissolve it. Xiaflex is the only FDA-approved injection for Peyronie's, but a couple of other agents were routinely used "off label" before Xiaflex became available. They include verapamil and interferon alphas. Creams containing these ingredients have also been tried, but the results are poor overall because of lack of penetration through the skin or into the tough plaque.

Xiaflex is a derivative of chemicals that the clostridium bacteria produce to invade the tissues they infect. The chemical, known as collagenase, breaks down the collagen in cell walls that puts up a defense against the bacteria. Xiaflex is a shot of that collagenase, repurposed to break down the unwanted collagen in the penis. It is very potent and very expensive. Each injection is only one-quarter of 1 cubic centimeter of fluid, and it costs a few thousand dollars to make a small batch. It's the equivalent of injecting liquid diamonds. But hey, who says you can't put a price on love? It has to be injected directly into the plaque and, although it may not completely dissolve the plaque, it will break it up so that it can expand and healthier soft tissue cells will grow into the gaps that form. Xiaflex must be given gradually because it also breaks down the walls of the blood vessels it may come in contact with. Furthermore, too much breakdown and the penis can rupture, which can be a surgical emergency.

The treatment is conducted in four cycles, with two injections per cycle, separated by 6-week intervals. Even then, there is about a 5 percent risk of the penis rupturing during sex or even just during an erection, so it's important to avoid sex for 2 weeks after treatment. Also after the treatment, the guy performs some simple stretching maneuvers on his penis daily to provide a mini

traction effect. Xiaflex injection is effective in at least 60 percent of men, with an average decrease in curvature of about 35 percent. This is an *average,* which means not much improvement for some but complete straightening for others. This injection cannot be used if the plaque and curvature are still changing. It is also not recommended if the plaque is too close to the urethra because of possible injury. Sometimes a plaque can become very calcified, which makes the tissue so rock hard that the medication cannot be injected into it.

Before there was Xiaflex, there was verapamil. Verapamil was developed as a medication for high blood pressure and heart irregularities, and that is normally how it is used, in pill form or as an injection into the veins. However, it also has the ability to break down collagen, but not as powerfully as Xiaflex. Nonetheless, more than 50 percent of patients using verapamil experience improvement.[12] Verapamil injections are given about every couple of weeks, directly into the plaque, and they seem to work better when combined with home traction therapy.[13]

With verapamil, a larger volume of fluid is injected at much lower cost than with Xiaflex. The injections work gradually and are typically continued for a 6-month period, or about 12 injections total. Because the verapamil is injected into the plaque and not into the bloodstream, there is no effect on the blood pressure and no risk of an interaction with other medications. It can be used at any time after the onset of Peyronie's disease, so a man does not have to wait until the disease stops changing, as with Xiaflex.

Interferon alpha-2b is another medication that has anti-collagen properties. Interferon stimulates the immune system and is typically used as an anticancer or an antivirus therapy. It breaks down collagen and it also stimulates some of the immune cells in the penis tissues to release their own collagenase (the chemical that makes Xiaflex work). Like verapamil, interferon alpha-2b is effective on more than 50 percent of guys.[14] Here too using the traction device at home can add some further improvement.[15] Because it activates the immune system, this medication can cause mild fevers and chills, even though it is just injected into the plaque.[16]

Aside from traditional needle injections, other techniques can be used to get the interferon alpha-2b or the verapamil into the

plaque. *Iontophoresis* is a technique that uses electrical current to push the medication molecules through the skin and into the plaque. It may be as effective as injections but it is not widely available.[17] Just rubbing verapamil cream on the penis is not likely to be as effective since it's not likely to penetrate into the plaque on its own.[18] In my practice, I utilize a MADA air injector, which pushes the verapamil liquid so forcefully out its tiny tip that it actually penetrates the skin and goes partway into the plaque without a needle. This treatment is given as a series of several "pops."

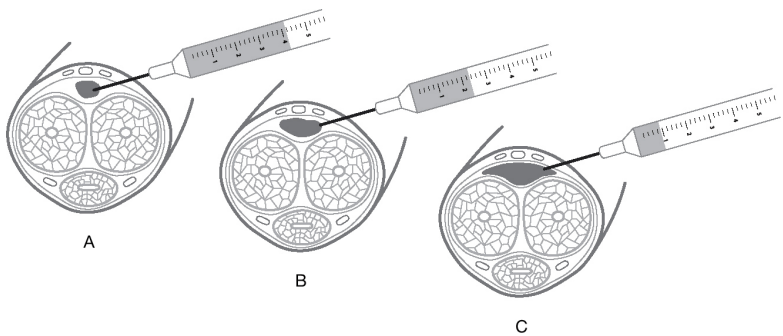


Figure 3 Injection therapy for Peyronie's disease

Surgery

Don't let the prospect of a knife near your privates make you shrink from proper treatment. Although the nonsurgical techniques work for a lot of guys, they don't work for everyone. Surgery can work for almost everyone, and it may be the only solution for some. Some surgeries are minimally invasive, while others involve a major remodel of the penis, renovating it with a penile implant. On the simpler side of the spectrum is *penis plication*. The concept is simple: Since the Peyronie's plaque won't expand on one side of the penis, the key to making the penis straight is preventing the other side from expanding by cinching it with some stitches. This technique is low risk and offers a quick recovery. The main downside is that there is some minor loss in length from the Peyronie's plaque that this technique does not restore, as it instead straightens the penis to the new length. Moving up the ladder of options, we come to removal of a small piece of tissue opposite the side where the plaque is to shorten

the opposite side. If the Peyronie's disease has caused significant shortening, then an alternative surgical approach that restores length may be better.

The plaque can be incised or even removed. This tends to be done for more severe or complex cases. When the plaque is operated on, a defect in the lining of the penis chambers is repaired with a graft material that may come from the person's own body, such as a piece of vein. Because this operation involves cutting through the lining of the chamber of the penis that fills with blood, there is a greater risk of problems with erections after surgery.

In men who already have poor erections, this operation may not be practical, and instead a penile implant is often recommended. Penile implant surgery with straightening at the time of the implant can provide reliable erections that are also straight. The details of penile implant surgery are covered in Chapter 12.

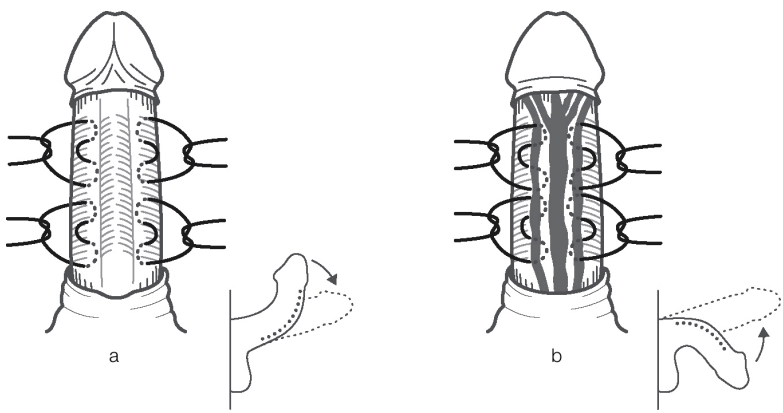


Figure 4 Surgical correction of Peyronie's: penis plications

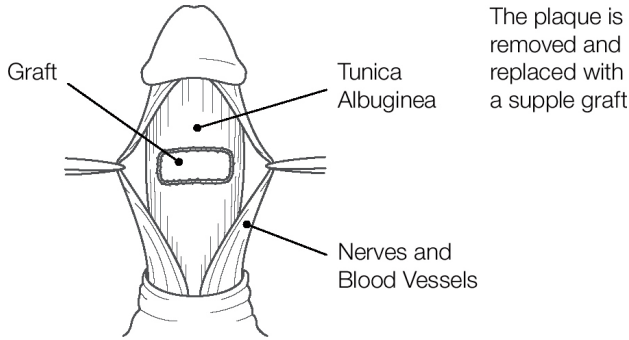


Figure 5 Removing or cutting the plaque

Source: Joel Gelman, MD, centerforreconsructivesurgery.org/peyronies-disease/surgery-graft/#.WiH.

Stem Cells

It seems that stem cells may cure whatever ails you, and Peyronie's disease is no exception. Although not a mainstream treatment, stem cell injections into the penis are showing promise in clinical trials.[19] A few urologists around the country offer this therapy outside of clinical trials, but because it is new, these treatments lack long-term safety studies so you must research the reputation and credentials of any such physician you seek out. The therapy is typically administered as an injection directly into the plaque or the penis chamber itself, one or more times. The stem cells do not dissolve or chemically break down the plaque the way the other injection therapies do. Rather, they may activate cells within the plaque to remodel themselves and smooth out the plaque.

Shock the Monkey!

Sonic shock waves are being used in some clinical trials to treat Peyronie's. Urologists have been using sound waves to break up kidney stones for many years, but then someone got the idea to try lower-energy sound waves on the penis. It turns out that this treatment stimulates blood vessels to grow and seems to help mild cases of erection problems. It decreases pain and decreases the size of plaques but may not decrease penile curvature.[20]

Unlike with kidney stones, the sound waves are not blasting the plaque into bits. Some trials may even combine the shock waves with stem cells for added bang.

Peyronie's disease is a common condition, but not many doctors understand how to treat it. The treatment options have improved recently, with the introduction of Xiaflex injections as well as the use of home traction. The search for a remedy can be frustrating, but with patience, knowledge, and the right doctor, this condition can often be successfully managed.

CHAPTER 18

PENIS 911: Emergencies Involving the Penis

Guys keep their penis tucked away for most of their lives, so when something goes wrong with it, they tend to keep that tucked away too—at least as long as they can. But certain problems with the penis—no matter how embarrassing they may be—are true emergencies and need attention right away. The last thing a guy wants to do is hobble up to the triage nurse in the ER and announce that he has a problem with his package. But in these situations, time is of the essence and delaying care can turn a big problem into a *really* big problem. This chapter reviews the true emergencies of the penis. In the unfortunate event that your penis suffers such a fate, you will know what to do and when to do it.

Priapism: It's Good to Keep a Hard Man Down

By now you have probably seen the commercials for Viagra or Cialis or Levitra that always end with "if an erection lasts more than 4 hours, call a medical professional!" As with just about everything good, there can be too much of that good thing. That's right, Mr. Happy can be *too* happy, and what follows can be very, very sad indeed. When an erection lasts too long, that's called *priapism.* Blood flows in, but it doesn't flow out, and pretty soon all the oxygen gets used up, and then the tissue starts to get damaged. This can be permanent. After hours of a big, hard erection, you can actually end up impotent.

The cause for this condition is very rarely a penis pill, but

more commonly other medications or medical conditions. The remedy ranges from a simple pill to major emergency surgery, and the consequences range from a l-o-n-g night to permanent impotence. That's why, in the case of priapism, it's good to keep a hard man down (after a while).

When the penis gets erect, it's because blood rushes in faster than it can rush out. Eventually the pressure builds up so high inside the blood-filled chambers of the penis that the veins that drain the blood get squished closed and the blood gets trapped inside. This is fine and dandy if you're randy, but remember that blood carries oxygen to all your cells, and once that oxygen gets shut off the blood is supposed to return to your lungs to pick up some more before your heart pumps it back to the rest of your body. If the blood is trapped in the penis, it can't get more oxygen, and all that trapped blood creates a traffic jam that congests the penis and keeps new blood with fresh oxygen from entering. At first (the first hour) it's fun, then (second and third hours) it's tiring, then (fourth hour) it hurts, then (after 5 to 12 hours) your penis is at risk of damage, then (after 12 to 24 hours) it's probably too late, and then (after 24 hours) it's game over. The longer priapism goes on, the harder it is to correct.

There are several reasons a guy might end "up" like this. The most common is self-induced. Men with severe erectile dysfunction may require injections in their penis to stimulate an erection because the pills aren't effective enough. Or some adventurous men may want to try out an injection even if pills work for them. This medication is much more potent than the pills, and sometimes it is *too* potent. Where guys can really get in trouble is using the injections without the proper supervision and instruction of a doctor. I have seen guys in the emergency room who got ahold of some injectable medications from their buddy, who thought he was doing his pal a favor. Also, some of the "male health" cash-on-the-barrelhead clinics almost exclusively sell these shots whether a guy needs them or not, and they can be too strong.

Penis Pills and Priapism

Pills such as Viagra, Cialis, Levitra, or Stendra all list priapism as a risk, but only a handful of cases have been reported.

Paradoxically, these very pills are actually now being prescribed in certain circumstances as a treatment for men who suffer from recurring episodes of priapism, or for men recovering from damage done by priapism. It turns out that in such severe cases, nitric oxide is needed to heal and restore the tissues in the penis, and these pills work by increasing nitric oxide in the penis.[1]

Other Medications That Cause Priapism

Some medications that have nothing to do with ED may occasionally cause erections and even priapism. Risperidone, which is an antipsychotic, is known to cause priapism, as is trazodone, a powerful antidepressant. Some other antidepressants have been known to cause priapism on occasion. Also implicated are blood thinners and blood pressure medications, but all very rarely.[2]

Recreational Drugs

Recreational drugs including marijuana, cocaine, and alcohol have been known to cause priapism. This is fairly rare, but it's a real buzzkill. Methamphetamines can cause difficulty reaching climax and then, eventually, erectile dysfunction, commonly known as "crystal dick." Cocaine can do the same.

Diseases

Certain medical conditions can cause priapism. Sickle cell anemia is the most common culprit. In this condition the red blood cells can become abnormally shaped, which prevents them from flowing normally through small blood vessels. This can make an erection not drain properly. For sickle cell patients, the underlying condition is lifelong and they are at high risk for experiencing the problem over and over again.

There are other diseases that cause abnormalities in the red blood cells, such as thalassemia, which may cause priapism less often. Leukemia, in which there are too many white blood cells, causes the blood to become thick and sludgy, making the blood in an erection more congested and less able to drain out through the veins. If a tumor in the pelvis arising from the prostate, the

bladder, or the rectum grows in such a way that it blocks the drainage of the penis, a priapism can occur.

Creepy Crawlies

Some spider and scorpion bites have been known to cause priapism because the venom paralyzes the small blood vessels in the penis and prevents them from squeezing closed.[3]

Treatment for Priapism

If you get an erection lasting more than 3 hours, you need to take matters into your own hands. The key is to increase adrenaline in your body because adrenaline will decrease the amount of blood flowing to the penis and reroute it to flow to the heart and lungs. You can get an adrenaline boost from ejaculating. You could also try exercise to boost your adrenaline. If that doesn't work, it's time for medication. You can snort over-the-counter Neo-Synephrine nasal spray or take two 60-milligram Sudafeds. These have adrenaline-like effects on your system. If your "head" is still "up," it's time to give your doctor a heads-up.

The goal of treatment is to get the trapped blood out of the penis and get fresh blood flowing again. It can be relatively quick and easy if you get to the ER within 3 to 4 hours, but it can be downright miserable if you don't come in until the next day.

If it hasn't been too long, a simple injection may do the trick. The injection is phenylephrine, the same stuff that's in the Neo-Synephrine nasal spray. Only now it's injected directly into your stiffie, not squirted up your sniffy, where it gets diluted in the rest of your blood. The phenylephrine goes to work slowing down the flow of blood into the penis by causing the spongy spaces inside the penis chambers to contract, like a sponge that squeezes itself. This takes the pressure off the veins so they can open up and drain the penis. The injection is given very slowly and repeatedly by a doctor with careful monitoring because the phenylephrine can severely increase your blood pressure if you get too much too soon.

Sometimes the blood is just too sludgy to drain so the doctor may drain blood out of your penis with a needle and syringe. The doctor may also flush saline (saltwater) spiked with

phenylephrine through and through your penis by injecting it in one spot but leaving a needle or IV catheter in another spot for the blood and irrigation fluid to come out. Any or all of these techniques may be used as time goes on and there is no improvement.

Once your erection finally goes down, you will be released back into the wild. You may be advised to take a daily penis pill such as Viagra or Cialis to prevent another episode but also advised to avoid sex for a couple of weeks. The penis pills may seem like the last thing you should take but they provide NO to the tissues, which helps them recover. Furthermore, sometimes the penis is prone to getting priapism due to a lack of proper NO production, and using the pills helps reduce the risk.

When priapism has been longer in duration, or is due to very sludgy blood such as with sickle cell anemia patients, the tissue in the penis gets damaged and cannot respond properly to the phenylephrine, and the veins stop draining as well. In this case, when the phenylephrine fails, the next step is to physically make a new drainage route for the blood. The urologist will take a sharp instrument and stab through the head of your penis (thank goodness for anesthesia) and on through into its blood-filled chamber—think hot dog on a stick. This allows the blood trapped inside the chamber to escape through the hole created at the tip. The blood then enters the head of the penis, where it can escape through its veins. Because the head is spongy, without the tough lining in the chambers, the pressure cannot build up enough to close off its veins. Once the channels have been bored out, the urologist will put stitches in the skin of the head of the penis where he entered. A variation of this operation is for the surgeon to make an incision just under the head of the penis, snip off the tips of the chambers, then sew the head back down. Once the blood drains, the penis can begin to be replenished with fresh, oxygen-carrying blood. Depending how long the priapism has been going on, how severely low the flow of blood, and the condition of the penis tissues to begin with, there may or may not be permanent damage.[4]

Even the shunt between the head of the penis and the shaft may not work. Sometimes another shunt may be tried between the root or base of the penis chamber and the soft, spongy tissue that surrounds the base of the urethra. Like the head of the penis,

the spongy tissue in the urethra is not confined by a tough layer so it can drain the blood without the veins getting squeezed closed. Another version is to drain the base of the chamber into an actual larger vein. These shunts allow bigger openings to be made. If surgery is performed in time, recovery of the natural erection can occur, but the chances are certainly less the more time that goes by and the more extensive the shunting that is required.

If the tissues of the penis have not been permanently damaged by oxygen deprivation, there is a chance the penis will heal itself internally after the shunt operation and the patient will be able to have erections again. If too much time has passed, there will be permanent damage, and he will not be able to have erections again without treatment. If the priapism has lasted more than 24 hours, you can bet there will be severe damage, with erectile dysfunction and shrinkage.

The damage can be too severe for pills or shots to work, and the vacuum pump may not work either because the tissue will no longer be able to expand properly. In these cases a penile implant is required because the chambers of the penis shaft won't be able to fill with and hold blood. As I described in Chapter 12, the penile implant can only fit inside the penis at the size it is during surgery—it cannot stretch a penis and make it bigger the way a breast implant or a tissue expander can make a breast larger. Therefore, once the penis shrinks down from the damage of a severe episode of priapism, the implant that can be inserted will be smaller too. In order to minimize the shrinkage and later frustration, the surgeon may recommend that the patient have a penile implant sooner rather than later, even during the same hospitalization in some cases.[5] This can allow the patient to preserve most of his length and return to sexual function sooner.

In very rare, very severe cases of priapism, in men with terrible circulation due to severe diabetes or other vascular disease, the penis may actually become necrotic and have to be surgically removed.

After a shunt procedure, the penis may still be enlarged due to swelling in tissues of the penis chambers, which is a reaction to the injury of oxygen starvation. The guy will have to avoid sex for a few weeks and may be prescribed penis pills like daily Cialis to help improve bloodflow and recovery of the damaged tissues.[6]

There may be erectile dysfunction following a severe priapism, and it may or may not go away. The penis will heal for up to 2 years at the molecular level, but the majority of the healing will happen in the first 6 months. Nonetheless, there may be gradual, ongoing improvement out beyond 6 months. A vacuum constriction device, described in Chapter 11, can be used to try to prevent shrinkage. If pills don't work, penis injections (also described in Chapter 11) or the vacuum device may, and if not, a penile implant may ultimately be required. Nutritional supplements that promote NO as well as a healthy diet may help recovery as well.

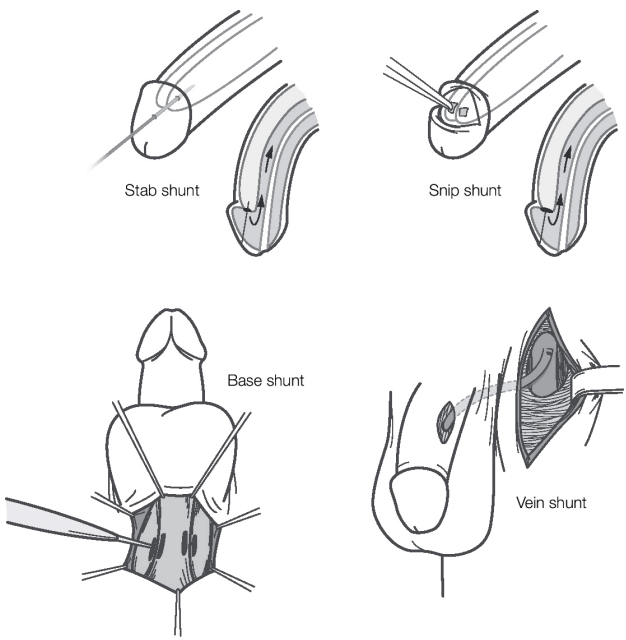


Figure 1 Shunt procedures

A Word about High Flow

There is an uncommon kind of priapism that is not painful or destructive to the penis. This typically occurs due to an injury of the artery within the penis, causing the blood to leak out the side. The artery cannot slow its own flow of blood by constricting because the blood is spraying out through the injured wall like a busted fire hydrant. Injury to the base of the penis, such as from a

pelvic fracture or a gunshot wound—or in southern California, where I practice, a surfboard injury between the legs—can cause this "high-flow" priapism. The blood is still draining out of the penis, but not as fast as it's pumping in, so the penis gets hard. Since the blood does flow out, the erection is not as stiff as when the blood is trapped. Furthermore, the tissues are not starving for oxygen and so they do not hurt and they do not become injured from lack of oxygen.

The treatment for this type of priapism is usually just giving the artery a chance to heal and wall itself back off. If that's not happening, then an interventional radiologist may be able to inject some clogging material into the artery. The risk of that treatment is ruining the normal bloodflow to the penis.[7]

I Didn't Know You Could Break That! Penile Fracture

Another penis emergency is a fractured penis. A penis fracture is not really a fracture of a bone but rather a rupture of the lining of one or both of the blood-filled chambers that create the erection. The lining of these chambers, called the *tunica albuginea*, is an unusually strong yet flexible tissue, which enables it to expand to make your penis bigger but then stop expanding and get harder and harder the more it gets pumped. It's like a tire in that regard. A tire can rupture or "blow out" if there is a sudden increase in pressure, like when the wheel hits a curb or the driver makes a sudden turn at high speed. So too can the penis "blow out" if there is a high-speed collision, say between your penis and your partner's pubic bone. Or if your partner zigs while you zag. In these situations, the torque on your shaft is just a little too much for that tough lining to handle, and pop goes your weasel. This kind of accident is most common with rear entry or "doggie style," followed by missionary position, with "laying on your back enjoying the view" posing the least risk. Even so, it can even happen when a guy rolls over in his sleep with an erection. Talk about a rude awakening![8]

When it happens, it really gets your attention. There is often an audible "pop" at the same time that you experience a sudden and very sharp pain. You lose your erection because the blood is no longer trapped, but then there are very profound swelling and

bruising that make your penis look like an eggplant. This is your clue to get to the emergency room right away!

The penis usually breaks in the area where the chamber lining is the thinnest, which is the underside of the shaft, close to the urethra. Sometimes the urethra gets injured too, and you may notice blood in the tip of your penis, or find it hard to urinate. As inopportune and embarrassing as this may be, you *must* get medical attention. In my experience, the most embarrassed party is the partner, who invariably tells me, “I didn’t know I could break it!

Once you are in the emergency room, the urologist may order an ultrasound to try to visualize the location of the rupture. And she will try to determine if you have an injury to your urethra. If there is blood in your urine or you cannot urinate, the urologist may perform a retrograde urethrogram, where x-ray contrast liquid is squirted backwards up your urethra to see if there are any points of leakage caused by an injury. Another way to check out the urethra is to insert a flexible fiber-optic telescope up the urethra. These procedures may or may not be performed while you are awake. They are tolerable, so don’t stress. The urologist will likely arrange to operate on you immediately unless the swelling is stable and the internal bleeding has stopped, in which case she may choose to schedule your repair with less urgency, semi-electively. It is possible to not have surgery and let the penis heal on its own but there is a greater risk of poor healing, resulting in impotence or curvature of the erection or stricture of the urethra, so most urologists would operate on you in most circumstances. There is always a risk of these complications with surgery, but the rates are low and full recovery of function and appearance is quite good in most cases.

In the operating room, the doctor will get busy saving Private Ryan. She will make an incision in the skin of the penis in order to get to the part of the lining that has burst. The rupture is often about the size of a fingertip but it can be as severe as a partial amputation, where both chambers and the urethra are blown apart. The surgeon will sew everything back together. If the urethra is injured, you will need to keep a catheter in your urethra for several days while the stitches heal. You won’t be able to return to sex for at least a month. You may feel the stitches under the skin but they typically soften and smooth out over

time.

Once you are all healed, you will likely have normal erections with normal sensation and normal urination, but if you delay getting treated, the chances are not as good. Next time, be very careful and avoid aggressive sexual positions for several months.

Not every sudden penis pain is a fracture. More commonly the snap-crack-pop is coming from an injury to the suspensory ligaments, which attach the penis to the underside of the pubic bone. These ligaments wrap around the penis like a hammock and keep it on the straight and narrow. If the erect penis is torqued downward too aggressively during sex or masturbation, they can stretch or even snap and cause pain and mild swelling at the base of the penis. An injury to the suspensory ligament does not require surgery but you should rest it, like a sprained ankle. Ibuprofen and some ice can help in the first few days.

Shortcuts: Amputation and Other Traumas (or Gone and Back Again, a Bobbitt's Tale)

Every now and then someone loses their head…and their shaft. Penis amputation is a rare injury, and it is usually deliberate. More often than not it is self-inflicted. I actually had a patient who did it twice! One of the more famous cases is that of John Wayne Bobbitt, whose angry, jealous wife "bobbed it." He was eventually reunited with his penis and went on to become a porn star.

The key to successful reattachment is rapid response. If you ever find yourself in this unimaginable condition, keep your (severed) head cool—it will slow down the tissue damage.

The surgery is fairly straightforward. The basic hardware is reconnected with stitches—this includes the two chambers that fill with blood and the urethra. The nerves and blood vessels that run along the top of the shaft are reconnected with microsurgical techniques, and then the skin is stitched up. A catheter is left in place for the urethra to heal around for at least a week or two. No hanky-panky for at least a couple of months. The results are surprisingly good when cooler heads prevail.

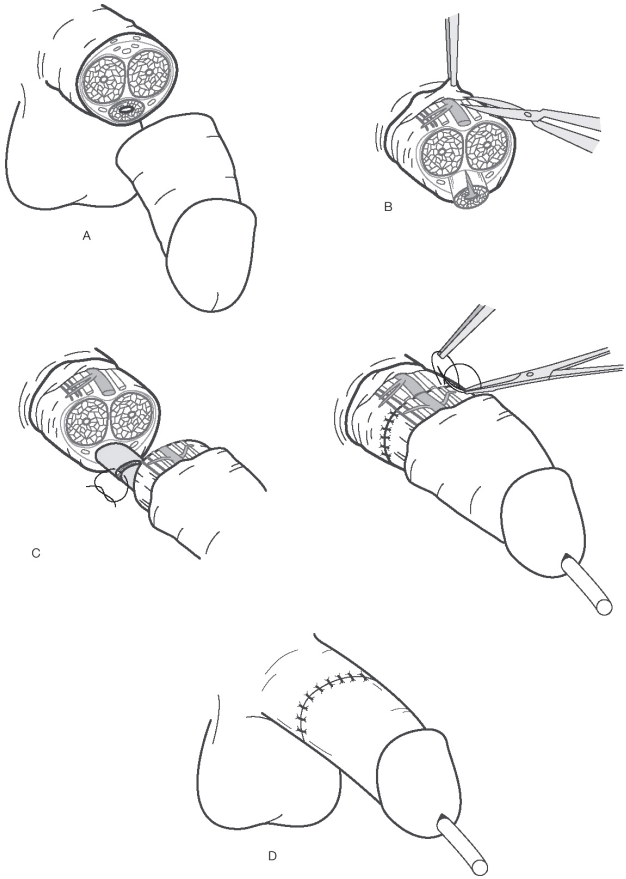


Figure 2 Penis reattachment

Zipper Trauma

It happens. If it's a minor skin tear, use some Bacitracin ointment, and as long as the surrounding skin doesn't get red or hot, you should be okay. If it's a big cut, then get to the doctor soon. Antibiotics may be required. Always make sure the skin is fully healed before resuming sex because the skin is your shield against bacteria.

Infections: Great Balls of Fire!

Infections of the testicles and epididymis can be due to sexually transmitted bugs like chlamydia or gonorrhea, but in many cases

they are not. Instead they may be due to your own normal bacteria that hide out in your rectum, hitch a ride in the bloodstream through a hemorrhoid, and jump off at the testicle or epididymis. The skin of the scrotum or nearby areas can become infected too. When conditions are right or the immune system is down, these mild-mannered bacteria just hanging out around your hair follicles can turn on you. Diabetics have the highest risk of this kind of infection due to poor circulation preventing the immune cells from getting to the bacteria effectively. The immune system tries but fails to eliminate the infection and as the white blood cells accumulate, they form pus. The infection eats away a pocket of space. As the pus accumulates, the pressure inside the abscess increases, pushing on the walls like an expanding water balloon. This pressure squeezes off the flow of blood. It becomes a vicious cycle and the abscess gradually expands, destroying poorly circulated tissue in its path. The only way to eliminate this infection is to cut open the abscess and drain it unless it breaks through the skin and drains itself. Only with the pressure relieved can the circulation deliver the immune cells and antibiotics that can eliminate the infection. Some really severe abscesses can fill much of the pelvis, wrapping around the rectum or extending up the internal muscles of the lower back (the psoas muscles). If you have an abscess, you typically have a lot of pain in the area and it will be squishy to the touch. In some cases the pus may break through and drain out, like a massive zit. Drainage is actually really good because it starts to alleviate the pressure and allow your body to fight back.

Depending on how big an abscess is, it may be drained with the person awake or it may require general anesthesia. Rarely, an infection may be so severe that the testicle or the epididymis has to be removed because it is dead or dying. After the abscess has been drained, it is rinsed out and then dressings or a surgical drain may be placed in the cavity in order to soak up or drain away any additional pus that accumulates. The cut is often left open to heal back in from the sides. This happens relatively quickly. A course of antibiotics is also prescribed.

You may have heard of “flesh-eating bacteria.” This is not some alien bug that hitched a ride to Earth on a comet, this is a very common group of bugs that live amongst us all the time. When they strike the genitals, it is commonly referred to as

Fournier's gangrene. The cause is usually streptococcus or clostridium bacteria. These bacteria live in your stool and can infect your urine or hide in your skin. Normally found in the colon, these bacteria are kept in the shadows, suppressed to very low numbers by other bacteria that are much more numerous and dominate the scene. But every now and then, a strain will mutate. A rectal fissure, for example, can allow the infection to reach the skin and fat of the scrotal area. When this infection hits, it can be fatal. The hallmarks are fever and rapidly advancing redness, tenderness, and swelling of the skin of the scrotum, penis, and even the abdominal wall. The infection actually follows the path of least resistance—a fatty, fibrous layer named *Colles' fascia* that runs from your anus, between your thighs, around your genitals, and up your abdominal wall. It needs no oxygen, but it may form gas bubbles in your flesh. It actually destroys the tissue it infects, along with its circulation. The infected flesh has to be removed rapidly to get ahead of its advance, much like a controlled burn is used to stop an advancing forest fire. As horrendous and gory as this sounds, if it's not done, the person will die. The key is to cut the patient's losses—literally.

After surgery, if a significant amount of tissue has been removed, skin grafting may be required to cover the scrotum and the penis. The bacteria don't infect or destroy the penis or the testicles because they have a separate circulation system than the overlying skin and fat.

Fortunately, flesh-eating bacteria are very rare. The majority of the time redness and swelling from an infection in the genitals are a sign of your immune system fighting back and winning. But the tide can turn, so if you think you have an infection, get seen quickly and get treated.

Stuck in the Middle: Paraphimosis

One last emergency that is more annoying than dangerous is called *paraphimosis*. This is when the foreskin is left rolled back behind the head of the penis too long and it swells up like a travel pillow. It is most common when an older guy's foreskin is rolled back to put a catheter in him and it's not rolled back down. The circulation of the foreskin is not very strong, and when it gets rolled back on itself, blood may not drain well. The veins get

congested and swelling sets in. The swelling then makes it hard to roll the skin back, and this sets up a vicious circle. Fortunately, there is a simple fix—squeeeeeeeeeze it. You may not be able to "handle" it, but a doctor can. He will squeeze the swollen foreskin flat so that it can be rolled forward. The best policy is to make sure that the old turtleneck is always pulled up nicely whenever you are "outside."

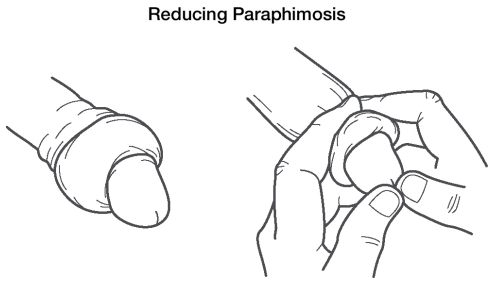


Figure 4 Paraphimosis being treated

CHAPTER 19

LUMPS AND BUMPS: Infections, Diseases, and Normal Variations of the Penis

W*hat's wrong with my dick?!?* Fear strikes the heart of the man who notices something "not right" with his penis. If you are the type to have a complete OCD meltdown at the first sign of a blemish, this chapter may help reassure you. On the other hand, if you are the don't ask, don't tell type, this chapter may be the wake-up call that could save your life or someone else's. Fortunately, penis cancer is rare and, aside from STDs, many lumps, bumps, and discolorations a man will notice are not harmful. But let's face it, it's a jungle out there. The levels of the most common sexually transmitted diseases are at all-time highs, and some cause penis cancer and cervical cancer. It's important to recognize their various signs and symptoms. When you're trying to score, you don't want to end up a "sore loser." Even if it's not contagious, a penis problem may still be bothersome or even dangerous. This chapter will help you troubleshoot anything that looks wrong down there and remind you why it's important to watch where you stick that thing!

Welcome to the Jungle

Worldwide, more than a million people a day become infected with a sexually transmitted disease.[1] In the United States alone, about 20 million new sexually transmitted diseases occur each year, and the number keeps rising—that's a lot of screwing around! The rates for gonorrhea, chlamydia, and syphilis are at all-time highs, especially for younger people and gay and bisexual

men. These diseases are not reliably reported to the public health department, so the situation is likely even worse than we know. Using a condom is your best defense. Most sexually transmitted diseases are spread by one or another combination of contacts between the genitals, anus, and mouth. If you get something, early detection is key because most sexually transmitted diseases are manageable, if not curable. Ignoring an STD can lead to pain, urinary problems, infertility, and even death. The following section describes various sexually transmitted diseases. This section is not meant to substitute for a good doctor, but rather to alert you to get treated if you have any symptoms remotely similar to those described herein.

Dishonorable Discharges

Some STDs cause a urethral discharge. **Chlamydia** and **gonorrhea,** the two most common of all reported STDs, are bacterial infections that can cause a discharge. This is an opaque whitish, yellowish, or greenish fluid. Sometimes you might notice it in your underwear, and other times it's just a tiny drop that you can only see if you "milk" your urethra. Sometimes there is irritation or even damage to the urethra or the testicles and their ducts, but in many cases there are no obvious symptoms. Either way, the infection can still be contagious and can damage a man's or woman's reproductive system, leaving him or her infertile. Infections and irritations of the throat or anus can occur as well.

Chlamydia and gonorrhea are easy for your doctor to diagnose with a urine test, blood test, or urethra swab. Gonorrhea is becoming harder to eliminate with antibiotics, but both infections are usually eliminated with prescription antibiotics. It's best for both partners to get tested and treated so they don't pass the infection back and forth.

Stealth Infections

Ureaplasma and **mycoplasma** are less common bacterial infections. They may cause itching or burning in the urethra but typically don't cause a drip.[2] **Trichomoniasis** and **gardnerella** are other infections that usually don't cause any symptoms in men but often do in women. Trichomoniasis is actually a tiny

parasite that more commonly causes a greenish vaginal discharge in women. *Gardnerella vaginalis* are common bacteria that can cause vaginal itchiness and odor in women, a common condition known as bacterial vaginosis (BV). In men, it only occasionally causes a frequent urge to urinate. These less common infections are not routinely screened for but can be straightforwardly detected and treated.[3, 4]

Warts and All

Human papillomavirus (HPV) causes genital warts and is transmitted by skin-to-skin contact. There are numerous strains of this virus, and a few cause cancer of the cervix or the penis.

A fleshy, cauliflower-like wart grows on the skin of the penis or vagina where the virus has entered. It can also occur in the throat or around the anus, depending on the exposure. If it occurs in the urethra, it may cause a drop of blood on the underwear or a tiny bit in the urine. These warts often cluster together in tiny cauliflower-like masses. The virus does not necessarily activate the skin to form a wart, and a person can carry the virus or even pass it along without any obvious clues. An HPV test performed by swabbing the genitals, anus, or throat may detect the virus.

Treatment may include topical prescription medication, or a doctor may freeze, burn, or cut off the lesions. Some strains of the virus that cause this wart can cause penile and cervical cancer, so women should make sure that they have regular cervical cancer screenings.[5]

Penile warts often come back and have to be retreated. Recently an HPV vaccine (Gardasil 9) has been released that prevents some strains of HPV. It's best to get the vaccine by age 11 or 12, when the immune system is young and strong and because it works best if given before exposure to the virus.

A rare variation of genital warts is called **giant condyloma acuminatum (Buschke-Lowenstein tumor),** caused by two strains, HPV type 6 or 11. It grows very rapidly and can take over the entire penis shaft in a few months. It is a form of cancer but it invades below the skin very slowly and almost never spreads to other organs or lymph nodes. It is treated the same way warts are.[6]

A Wartlike Infection

Molluscum contagiosum is a viral infection that can cause small, whitish, pearly bumps with a dimpled center to appear on the penis and other areas of skin as well. It is passed by skin-to skin contact including but not limited to sex. It does not lead to any other problems and usually goes away on its own but it can take some time so freezing, burning, or cutting by a doctor is an option. Once it's gone, the person is not contagious.

Made from Scratch

Crabs and scabies are tiny "love bugs" that are transferred from one person to another with a little bump and grind. **Crabs** are pubic lice, tiny but visible insects that are "bush dwellers," living and laying white eggs in the pubic hair. **Scabies** are tinier bugs called mites that are "cave dwellers," actually burrowing under the skin and laying eggs there, creating intensely itchy red spots. They are both highly contagious but curable with medicated lotions, shampoos, and detergents. In addition to treating your body, you have to clean your clothes and bedding to get rid of these nasties.[7]

The Never-Ending STDory

Genital herpes is a viral infection caused by the herpes simplex type 2 virus. This is different from the herpes simplex type 1 virus that causes cold sores that blister up on the lip. The virus can cause recurring outbreaks of painful small, clear blisters on the shaft of the penis or the labia of the vulva. It can also affect the thighs, buttocks, anus, or mouth, depending on the exposure. But most people who are infected with herpes never actually have an outbreak at all, so they may never even know they have it. For those who do get outbreaks, they can recur several times a year or only occasionally. When genital herpes comes back, it usually reappears as a smaller patch and goes away faster. The blisters crust up and then heal.

Herpes can be diagnosed with a blood test or a test of the fluid from the blisters. There is no cure for herpes. It's the gift that keeps on giving, but it can be suppressed with prescribed

antiviral pills. Treatment minimizes discomfort and decreases the risk of giving it to someone else.

Sores

Syphilis, chancroid, and **lymphogranuloma venereum (LGV)** are bacterial infections that cause ulcers on the penis, vagina, or anus, depending on the contact. Syphilis can take on three distinct forms if left untreated long enough. Syphilis ulcers do not hurt and eventually go away. Without treatment, stage two sets in about a month later with a spotted rash on the palms and soles of the feet. If still untreated, the bacteria go dormant only to reawaken years later, causing severe damage to internal organs and even the brain. Unlike syphilis, chancroid ulcers are very painful. LGV causes very small ulcers, but both chancroid and LGV can give rise to painful pus-filled abscesses in the lymph nodes of the groin.[8] LGV can be a real pain in the ass, inflaming the rectum and even causing anal fissures and fistulas.

Syphilis is diagnosed with a blood test and easily cured with good old penicillin. It is on the rise primarily in the male homosexual population. If left untreated, the damage to organs and nerves can be permanent. Chancroid can be hard to diagnose in the lab, so it's usually diagnosed based on the symptoms. It is curable with a single dose of prescription antibiotics. LGV can be diagnosed by a rectal specimen, needle specimen from a lymph node, or blood test and it can be cured with a 3-week course of prescription antibiotics.

Bad Blood

The most lethal sexually transmitted diseases, **AIDS, hepatitis B,** and **hepatitis C** are transmitted by blood and semen, typically through breaks in the skin of the penis or walls of the vagina or throat or anus. These infections do not cause any lumps or bumps on the penis. However, having one of the other sexually transmitted diseases increases the odds that you also have HIV or hepatitis or at least makes it easier to catch them since your skin barrier is usually compromised at the site of the sore. HIV, or human immunodeficiency virus, causes AIDS; it is a retrovirus that invades certain white blood cells in your immune system

called T cells. In the past, HIV was usually rapidly fatal. Although it cannot be cured, it can be lived with for many years, thanks to advances in medication. Many do not have access to these medications, and HIV continues to be a devastating epidemic worldwide. Although in the United States it is more prominent in the homosexual population, it affects men and women and either can pass it on. Hepatitis B and hepatitis C are also carried in the blood and semen. They can be passed from one person to another from sexual contact, sharing of hypodermic needles, or blood transfusions. These viruses attack the liver and eventually cause liver disease and, often, liver cancer. There is a vaccine for hepatitis B, but not for hepatitis C. Only recently have breakthrough medications provided a cure for hepatitis C. You may not know you have hepatitis B or hepatitis C for many years, so if you suspect you may have been exposed you should get tested right away.

All the sexually transmitted diseases, from AIDS to Zika, can be prevented by using a condom. All these diseases require skin-to-skin or body fluid–to–body fluid contact and, short of abstinence, condoms or dental dams are the only way to ensure that doesn't happen. A vasectomy does not provide any protection against sexually transmitted diseases, nor do birth control pills, IUDs (intrauterine devices), or diaphragms. Long-term monogamous relationships lower your risk as well.

A Visit to the Junkyard

The following sections describe various lumps and bumps that are *not* sexually transmitted diseases. Some are due to infections, but not typically from sex. Other conditions are due to inflammation, an overactive immune center, or just variations from the norm. Cancer is rare but dangerous, so recognizing it early can save your life.

There's a Fungus Among Us

Jock itch, a close cousin of athlete's foot, is caused by the fungus *tinea cruris*. It hides in moist places like gym showers and used wet towels, sweaty underwear, and sweaty socks. It infects dark, moist places like the crease between your thighs and scrotum,

causing redness and itching. The rash may have crusty or blistery borders and its center may be brownish. Protect yourself by drying off well and putting on clean underwear after athletic activity. As proud as you may be of your package, don't wear clothes that are too tight because they can break down your skin and let the infection take hold easier. If you have athlete's foot, you need to treat it or you can spread it to your groin, even just by passing your feet through your underwear as you get dressed. Consider putting on your socks before your underwear. Also use shower shoes when you are in a gym, and make sure to change your underwear after it gets damp from sweat.

You can treat jock itch yourself with a variety of over-the-counter sprays or ointments. The key is to treat for a full 2 weeks even if it seems to clear up after 1 week because some of the fungus will become spores when you treat it. Spores are like little biological bunkers that are protected from the medication. Then they reemerge a week later. If you keep treating for 2 weeks, you will knock the rest of the fungus out; if not, you run a high risk of the infection coming right back. If your rash doesn't clear up, see the doctor for an evaluation. You may be prescribed stronger sprays, ointments, or even oral antifungal pills.

Another common fungus is Candida albicans. It likes to hang out under the foreskin where it's moist and dark and is more common in men with diabetes. Reddish dots or larger flat splotches form on the head of the penis or just under it, on the foreskin. Pain or itchiness is common, and sometimes the foreskin can get so inflamed it contracts and narrows, making it hard to pull back.

A doctor will commonly refer to candida as a "yeast infection." She will treat it with prescription antifungal ointments. As with jock itch, it's best to treat for a full 2 weeks even if the visible rash clears up so that hidden spores are wiped out too. More severe cases may be treated with prescription antifungal pills. Circumcision may be recommended in cases where it keeps coming back or the foreskin is damaged. The fungus can be passed back and forth between sexual partners.

Better Red Than Dead

Cellulitis is a bacterial infection of the skin and underlying fatty

tissues that causes redness and swelling. The bacteria may be an aggressive strain of the staphylococcus that normally live on your skin or a nasty strain of bacteria that came from your stool, such as clostridium or streptococcus. These infections are more likely if you have poor circulation and an impaired immune system from diabetes or malnutrition or alchoholism. Cellulitis may get its start from a pimple or cut on your groin or genitals or it may spread from a rectal fissure or fistula.

The bacterial infection causes the skin to become red, swollen, and tender wherever it occurs. This may be on the scrotum, shaft of the penis, groin, or anal areas. It is common to have a fever too. In some cases the bacteria get walled up by the tissues, creating an abscess, which is a pocket of pus. Pus is comprised of your immune cells battling it out with bacteria. In the worst-case scenario, the bacteria do not stay contained and actually kill the tissue they are infecting, causing areas that are dusky or black rather than red and swollen. This is called *gangrene* and it is the telltale sign of flesh-eating bacteria, which can be lethal, spreading quickly up the torso, leaving dead skin, fat, and muscle in their path.

Don't hesitate to see a doctor if you have redness, swelling, pus, or dead tissue on some part of your privates. Antibiotics will almost certainly be required, and you may need to be hospitalized. If you have an abscess, antibiotics alone cannot eliminate it because the bacteria are walled off from the antibiotics—it will have to be surgically cut and the pus drained out. If you have gangrene, it has to be surgically removed. If you have flesh-eating bacteria, the infected skin, fat, and muscle will have to be cut away. Otherwise, the bacteria will spread rapidly —within hours—and destroy more and more of your flesh, including all the skin on your penis, scrotum, and pelvis. This can be lethal.

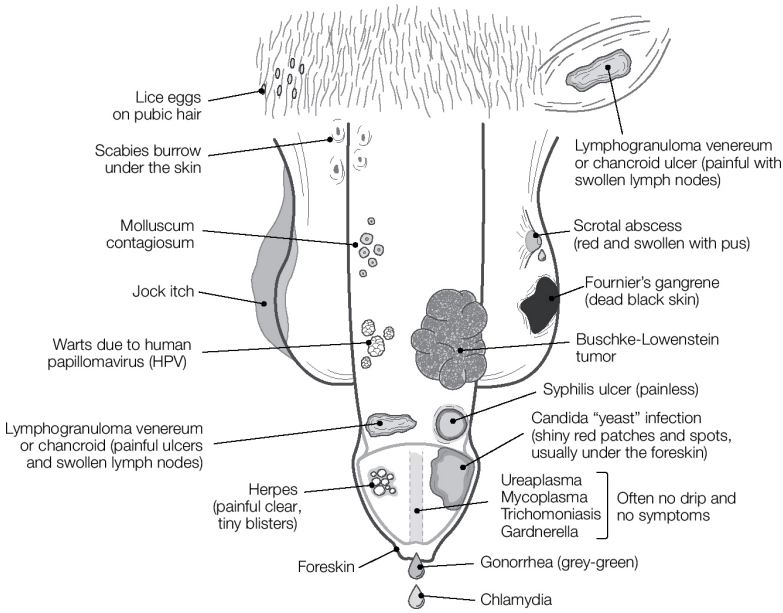


Figure 1 Infections of the genitals

A Touchy Situation

Contact dermatitis on the penis is inflammation of the skin from contact with something irritating. Sometimes a chemical in a new bath soap or laundry detergent can irritate the penis, causing mild burning or itching in the head or shaft or the urethral opening. This is more likely if you travel a lot, since you are then exposed to various bath soaps and detergents on the towels and sheets of different hotels. This irritation will usually just go away with time, but it can be improved with over-the-counter cortisone ointment, applied twice a day for a few days.

Skin Gone Wild

A number of rashes of the penis are due to areas of skin that grow too fast or die too soon. **Psoriasis** is a condition where a patch of skin grows new layers too quickly as a reaction to inflammation from the person's own immune system. Normally the skin cells last about a month before they are replaced in an orderly fashion. When psoriasis flares up, new skin cells form about every 3 to 5 days, well before the old ones are ready to drop, and this causes a

buildup of reddish, thickened, scaly, itchy or painful skin on the penis and scrotum as well as other parts of the body, most commonly the elbows, knees, scalp, and lower back.[9] It may flare up due to increased stress, excessive alcohol intake, or a bad infection that triggers the immune system.

This condition is diagnosed by a doctor, usually based on appearance, but a skin biopsy can confirm it. Psoriasis is normally managed with a prescribed steroid cream that shortens the episodes. It is not an infection and is not contagious, so your partner can be reassured.[10]

Lichen sclerosus is the opposite of psoriasis. In this case the immune system shuts down skin cells' growth. The skin becomes fibrous, whitish, and tight. It happens on the foreskin, shaft skin, and sometimes the urethral opening of the penis. It affects the female genitals too, but in men it is given a special name, *balanitis xerotica obliterans (BXO)*. Sometimes this condition can progress to penis cancer.

If BXO occurs on the foreskin, it can be hard to pull the foreskin back or the skin may stick to the underside of the head of the penis. If BXO affects the opening of the urethra, it may narrow it, making it hard to urinate. The affected areas can crack and bleed more easily than normal skin.

Like psoriasis, this condition is typically diagnosed by a doctor and treated with prescription steroid cream. Occasionally surgery may be required to fix a very narrowed urethral opening. Other autoimmune conditions that suck the life out of skin cells include **lichen planus**, which leaves the skin of the head of the penis looking cobblestoned, and **lichen niditus**, which covers the penis skin in tiny white dots.[11]

No Problem

Several lumps and bumps are normal variations of the skin or minor changes that can be left alone. **Angiokeratomas** are tiny blobs of blood vessels that pop up on the head of the penis or scrotum. Sometimes they are on the abdominal wall and thighs. These are dark red or bluish in color and range in size from 1 to 6 millimeters. Usually they don't cause any bother, but they can bleed if you pick at them or scratch them.[12] **Pearly papules** are tiny bumps in rows just under the head of the penis. Often

mistaken for warts, they are completely normal, not infectious, and require no treatment. They are more common in uncircumcised men, occurring in 1 in 3, than in circumcised men (fewer than 1 in 10).[13]

A few other common bumps on the penis and scrotum do not require treatment. Some guys are born with small, irregular skin growths on the penis or scrotum that may be considered birthmarks. Doctors call these **skin tags**. If a skin tag is very bothersome, it can be surgically removed. In addition, glands around the hair follicles can make tiny bumps that contain an oily substance called sebum, giving the appearance of "chicken skin." This is normal, but sometimes a gland may get clogged and slowly fill up to become a hard, whitish nodule under the skin that looks almost like a buried pearl. These are called **sebaceous cysts** and they are common and require no treatment. They do not pop like pimples, so don't try to squeeze them—you run the risk of injuring yourself and possibly getting an infection. If they really bother you, they can be surgically removed.

The Big C

Fortunately, **cancer of the penis** is very uncommon, particularly in the modern industrialized world. Penis cancer can be very aggressive and lethal, and the cure rates are poor because guys tend to avoid getting checked out due to embarrassment or fear. Early detection is your best chance to survive and to keep your penis.

Penis cancer is thought to be due to infection by HPV type 16, which also causes cervical cancer and genital warts. It is also thought to be due to gunk stuck in the junk. Fluids and toxins that become trapped under the foreskin in uncircumcised men create chronic inflammation, which can lead to cancer. Guys who are circumcised as infants almost never get penis cancer. Guys who are circumcised later get it much less often than men who are not circumcised. Uncircumcised men still get it only rarely, especially if they observe modern hygiene practices.

Sometimes penis cancer affects only the skin, but if left untreated, it can invade and spread. If a guy is unable or unwilling to pull back his foreskin, he may not realize he has a cancer hidden under it and it may become invasive before it

bothers him enough to seek treatment.

Superficial Penis Cancer

Cancer that just affects the skin without invading deeper or spreading can mimic some of the other lumps and bumps outlined in this chapter. It can be mistaken for yeast infections, large genital warts, or autoimmune rashes like psoriasis or BXO. Usually it is a lot more irregular or "angry" in appearance, but sometimes the only way to be sure is to perform a biopsy of the area. This is particularly important if the "rash" doesn't clear up with treatment the way it is expected to. There are two main types of superficial penis cancer. One is called **erythroplasia of Queyrat**. *Erythroplasia* means "red area" and *Queyrat* is the name of the doctor who first wrote about it. It is a velvety red patch on the inner foreskin and/or head of the penis. The other type is called **Bowen's disease** (Bowen was the doctor who wrote about it first). It looks very different, appearing as a flat, dull, patchy brownish and scaly area. About half the time it hurts or itches but about half the time it doesn't, so you have to roll back the foreskin and look for it.[14] Both variations are treated the same way. If the cancer is just on the foreskin, then a circumcision will take care of it. But if it's on the head of the penis, then very delicate surgery called Mohs micrographic surgery is required, where fine slices are taken, like a super-precise deli slicer, just until the cancer is gone. This is done to preserve the precious real estate that is the head of the penis. Alternative treatments include laser burning, topical medications, and radiation.[15]

Invasive Penis Cancer

Although rare, invasive penis cancer is aggressive and often lethal. It can move throughout the body quickly and is hard to cure once it has spread. These cancers usually start from the skin itself and so they are called "squamous cell cancer" because the scientific name for skin cells is *squamous cells*. Invasive penis cancer often looks very irregular and "angry." It may have rough and irregular borders, ulcers, and bleeding. The cancer may invade the fatty tissue under the skin or deeper still into the blood-filled chambers of the penis or the urethra. It can then

travel through the blood vessels and lymph channels and spread to lymph nodes and other organs of the body. A doctor will diagnose the cancer with a biopsy and will attempt to determine whether or not it has spread with radiology scans. If the cancer is caught very early into its invasion, it may be treated much like superficial penis cancer but with larger surgical removal of that area, which may require skin grafting, laser burning, topical medication, or radiation. Otherwise, more aggressive surgery is required. This means surgical removal of part or even all of the penis. Radiation can be used as an alternative. The surgeon may also need to take out lymph nodes in the groin or the pelvis at that time or at a follow-up surgery, depending again on how invasive the cancer is. Radiation and chemotherapy will be required if the cancer has spread into the lymph nodes.[16]

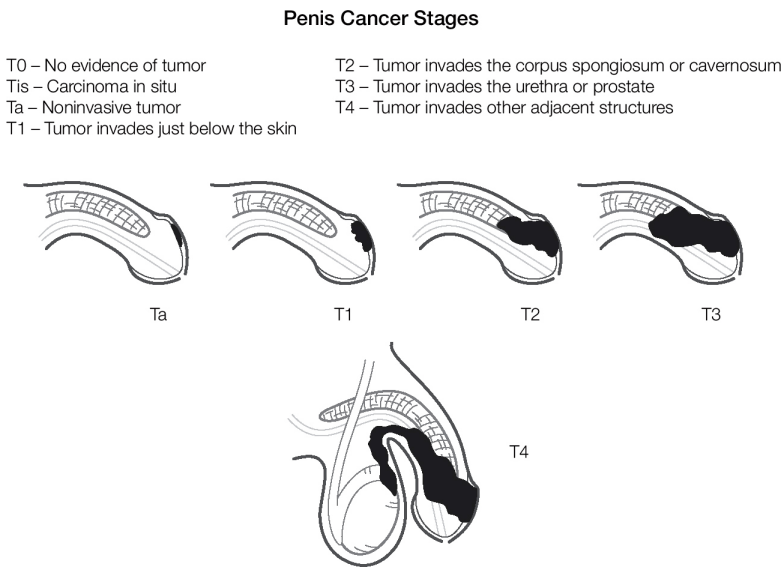


Figure 2 Staging of penis cancer

It's Not a Tumor!

Zoon balanitis (written about by Dr. Zoon) is an inflammation that looks like a shiny reddish or brownish patch on the head of the penis and the shaft just below it, sometimes with small, darker spots. It usually doesn't hurt or itch, and sometimes it may bleed. It occurs in uncircumcised men in their fifties and sixties.

It is thought to be due to irritation of the head of the penis by trapped fluids and toxins under the foreskin. Guys may be more at risk if they don't or can't pull back their foreskin to clean under it. It can look a lot like erythroplasia of Queyrat, the superficial form of penis cancer mentioned earlier.

The doctor will often diagnose Zoon balanitis with a biopsy. The treatment is usually circumcision, as it does not go away with antibiotics or antifungal ointments. Once the foreskin is gone, the irritation causing the abnormal patch is removed and the skin heals itself. Other treatments include prescription steroid creams or immune-suppressing creams. Zoon balanitis is not contagious and does not become cancerous.[17]

A lump under the skin of the shaft of the penis is almost never a cancer. The most common cause is **Peyronie's disease**, an overgrowth of collagen in that spot. It can be tender and make erections painful. Peyronie's disease is covered extensively in Chapter 17. The other explanation is a clotted vein. It too can be tender. It requires no treatment, although aspirin can help dissolve the clot slowly. This type of clot is too small to be of any risk to your lungs the way larger blood clots can.

If you see something or feel something unusual on your penis, make sure you get checked out by a doctor. Most lumps and bumps of the penis are easily diagnosed and easily treated. Never let embarrassment or shame get between your penis and proper care.

CHAPTER 20

THE MAKING AND UNMAKING OF A PENIS: Variations in Genitals and Gender Identity

"Snips and snails and puppy dogs' tails, that's what little boys are made of." So goes the nursery rhyme, but it's a lot more complicated than that. Boys are made of many parts, the most obvious being the penis. How boys end up with penises and girls end up with vaginas is the result of genes, hormones, and the environment. We all start out as girls, and then for some, a penis forms and other remodeling happens. Understanding how the penis develops allows us to understand why some boys are born with penises that are abnormal. In some cases, rebalancing hormones can help restore the penis to a more normal state. Surgical correction can be challenging, and sometimes reconstructing the child as a female is more feasible.

There is a particular center in the brain that is critical for gender self-identity. This area usually develops differently in boy brains than it does in girl brains, but not always. When an exception happens, a man will literally feel like a woman trapped in a man's body and vice versa—not by choice, but by biology. Understanding the brain's influence on gender helps us to better understand why infant gender reassignment can be fraught with frustration for a person as he or she grows up. It also helps us understand why some boys are born who will not want a penis and why some girls are born who really will. Doctors and society have come a long way in our ability to help these patients through a combination of hormone therapy, complex surgery, and enlightened understanding.

Let's Start at the Beginning—of Life

A baby human's genitals start to form during the 7th to 9th week after conception. Up until then, the fetus has been neither male nor female. The fetus has what is called a "genital bud," which is a spin-off of the tail bud that in humans disappears and in other animals goes on to make a tail. If the fetus is male, the Y chromosome allows the formation of testicles, which then release testosterone. Testosterone makes the developing vagina fuse in the middle and become a penis. What otherwise would have become the labia majora become the two halves of the scrotum. What would have been the clitoris enlarges to become the head of the penis, and the chambers that fill with blood to make the penis erect grow larger than the much smaller versions that would be attached to the clitoris in a girl. The urethra lengthens and tunnels up through the head of the penis. From the 3rd month of pregnancy until near-birth, the testicles will slowly work their way from inside the abdomen, down into the scrotum. If the fetus is female, she forms ovaries instead. Without testosterone, this all wraps up by the 13th or 14th week. At the same time, other internal features of both sexes develop, such as the uterus and ovaries or the prostate and seminal vesicles. The testicles release a special chemical called *Mullerian inhibiting substance* that prevents the uterus and fallopian tubes from forming in males.

Things can go wrong along the way. Let's start at the tip. The foreskin grows from just below the head of the penis and covers it up completely, then the tip of the foreskin disintegrates, leaving it as a sleeve instead of a sock. If it doesn't disintegrate enough, the opening of the foreskin will be too tight. Rarely, some boys are born with no foreskin or with very little, which results in their being born with a circumcision, more or less. Also rare is excess foreskin, which can be a trickier situation because it can trap urine and is difficult to keep clean. A circumcision can help, but it must be done carefully because the extra foreskin is not always a simple tube of skin. What seems to be a simple cut can result in a skin doily.[1]

A more common condition is **hypospadias**, when the urethra does not form all the way to the tip of the penis. It may end at the base of the scrotum, midway up the shaft, or just below the head. When the urethra is not completely formed, neither is the

foreskin: It will look more like a hoodie than a turtleneck. The cause is not completely understood, but hypospadias is more common in premature births and when the mother suffers from the flu, high blood pressure, or diabetes early on in her pregnancy. Also, there seems to be a slight increase among babies conceived with in vitro fertilization. There is also evidence that many chemicals we are exposed to can act like estrogen and may interfere with normal male development. These chemicals are called “endocrine disrupters” and they are everywhere, from plastic bottles to toys to medications to makeup.[2] Surgical correction of hypospadias is usually performed during infancy. The foreskin is used to lengthen the urethra, so it must not be removed with a circumcision before the urethra is repaired! For repairs where the distance from the urethra to the tip of the penis is substantial, skin from other areas may be used to make a new passageway.[3]

Rarely, problems may arise with the development of the shaft or head of the penis. These structures can make like a blackjack hand and double down, split, or fold.

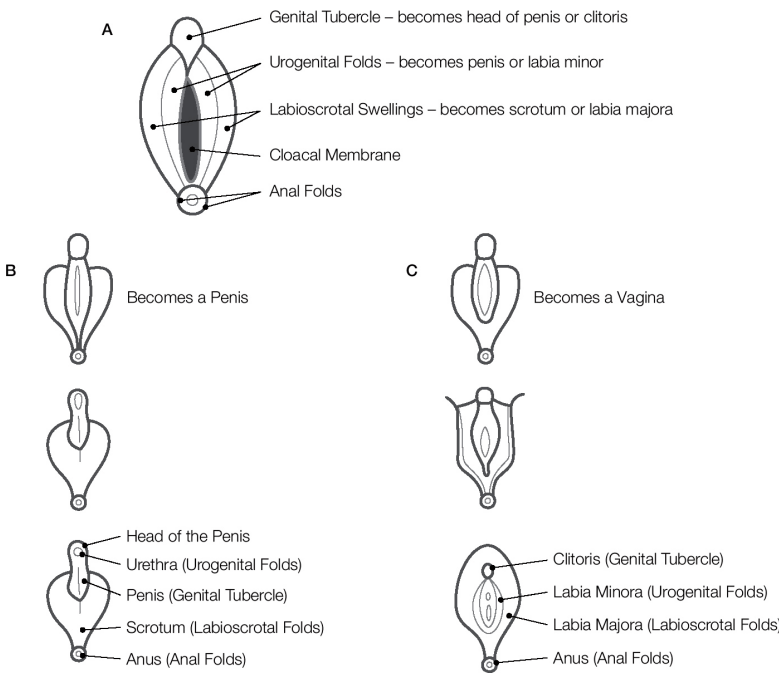


Figure 1 Formation of the penis or the vagina

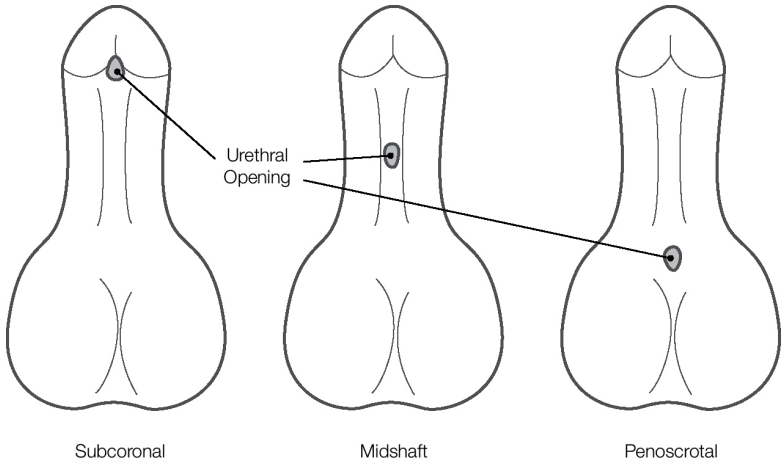


Figure 2 Hypospadias: different degrees of severity

When the Fetus Doubles Down (Down There)

Diphallia is a condition in which the genitals of the fetus get duplicated, resulting in two penises, two rectums, and two anuses. Sometimes the doubling is incomplete and one of the penises is much smaller, like a T-rex arm. Two heads are *not* better than one. Urethras or rectums can end up completely blocked, creating a medical emergency. This condition can be corrected with surgery, in which one of the "twins" is removed.

When the Fetus Splits (Down There)

Sometimes the penis doesn't double down, but rather splits. When the two halves of the penis shaft don't fuse properly, the penis chambers and the head end up somewhat separated by a long, deep groove. As a result, the urethra opens up way back towards the base of the penis, on the top side. This condition is called **epispadias**. Often there is urine leakage because the bladder sphincter doesn't close normally. With epispadias, the penis curves upward, which can make aiming for the bowl a challenge.[4] Commonly, the lower pelvic bones don't come together, nor do the two sides of the abdominal wall or the two sides of the bladder. The unfortunate child is born with the penis completely split apart and the bladder open and exposed. Fortunately, this condition can be treated by a team of talented

pediatric surgeons. The two halves of everything that didn't come together are surgically brought together, from the bones to the boner.

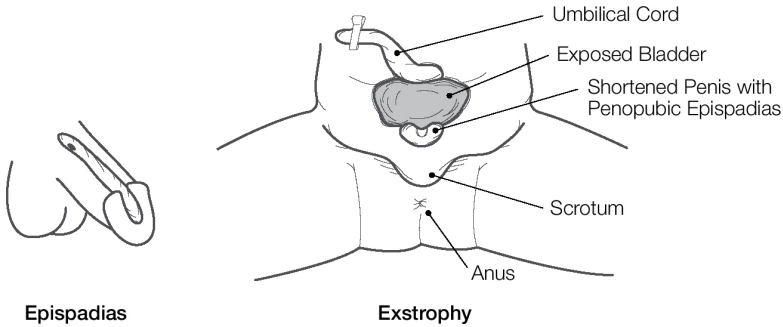


Figure 3 Epispadias and bladder extrophy

A very rare situation is that of a double urethra, and even more rare is a double bladder. In these cases, there is one normal urethra and then a second that may end short on the underside of the shaft, but without any curvature to the penis.

When the Fetus Folds (Down There)

Sometimes the developing penis just bows out. **Aphallia,** meaning "no penis," is a rare condition that usually occurs with other life-threatening birth defects. It happens because the genital bulge never properly forms in the fetus. Rarely, a boy may be born without a penis but with no other severe abnormalities. He will have testicles, but his urethra will typically open near his anus. Another reason a baby boy may end up with no penis is from a severe circumcision complication. Surgical reconstruction of a penis in a male infant is extremely difficult or even impossible, while creation of a vagina is fairly straightforward and usually successful. When a baby boy's penis is absent or severely injured, the parents and medical team may choose to surgically reconstruct the genitals as female and, with the aid of hormone supplements, raise the child as a female.

Sometimes female infants may be born with what appears to be a penis due to increased growth of the clitoris due to excess levels of testosterone produced by overactive adrenal glands. The adrenal glands sit on top of the kidney and normally produce

several hormones that regulate various body functions. Excess testosterone will stimulate the clitoris of the female fetus to become abnormally enlarged and the vagina to close in the middle, so the baby girl may appear to have a penis. In less severe forms, the clitoris is enlarged and the labia may be partially fused together, making the vaginal opening smaller than usual. These babies have normal internal female organs and, in more severe cases, they may undergo surgery to reduce the size of the clitoris and open up the vagina. They usually also suffer from severe electrolyte imbalances, which are also due to the abnormal adrenal glands, so it's critical to recognize that the abnormal genitals may be due to this more serious medical condition.

Too little male hormone can cause a genetic male to be born with female genitals. **Androgen insensitivity syndrome** occurs when the male fetus has abnormal testosterone receptors throughout his body. Even though the fetus is genetically male, the testosterone just bounces off the cells, which lack testosterone receptors. As a result, the child's genitals don't develop into a penis. The child is born with a vagina but it is short, and there are no female internal organs such as a uterus, ovaries, or fallopian tubes. The testicles are up in the abdomen since there is no scrotum for them to drop into. Some of the testosterone is converted into estrogen, so eventually these individuals develop femalelike breasts. They may undergo surgery to enlarge the size of their vagina and remove the testicles.

Guevedoce, or "penis at twelve," is a genetic condition well known in the Dominican Republic. One out of every 90 boys gets this nickname because he will actually not develop a penis until age 12. Until then, he will appear female and be raised as such. These boys do not produce an enzyme called 5-alpha reductase, which converts testosterone into dihydrotestosterone. Dihydrotestosterone is like a steroid on steroids. It has a much more potent effect than testosterone on male parts like the penis and prostate and hair growth. These children have testosterone receptors, but without the even more powerful dihydrotestosterone to stimulate their penis development, they are born with female-appearing genitals. When puberty comes around, at about age 12, the child gets a surge of testosterone from his testicles, which is enough to make his penis finally

develop fully and voilà—penis at 12! This gives a new meaning to "coming of age." In a society where this is a common condition, these guys then go on to live normal lives as men, though their facial hair is a bit sparse and their prostates are a bit smaller.

Buried Treasure

Much more common than being born with no penis is being born with a **hidden or buried penis**. This means the only part of the penis sticking out above the scrotum is the foreskin. The shaft and head of the penis are trapped underneath the fatty tissue right over the pubic bone. Normally the shaft of the penis is surrounded by a fine layer of tissue that is a soft, surprisingly stretchy combination of fat and collagen fibers. If you are a "grower," you have an up close and personal appreciation of this elastic tissue. In the case of buried penis, that layer of fat and fibrous tissue is very disorganized and loses its elasticity. This keeps the penis shaft held back under the fat pad that surrounds it. The hidden penis will persist into adulthood. The remedy is usually surgery to release the tissue that won't stretch and then possibly liposuction or additional surgery to cut away the fat pad around the penis. In these cases the penis is not abnormally small, it is just hidden from view, waiting for its day in the sun. Most guys sporting buried treasure can blame it on being obese. When you add diabetes to the mix, the circulation suffers and the foreskin can shrink and close up, aggravating the appearance of a hidden penis.

There are also a variety of abnormal variations of the scrotum and where it attaches to the penis. For example, the scrotum can attach to the midshaft or even the end of the shaft of the penis, giving the flaccid penis a webbed appearance and making it appear small. The erection, however, is completely normal in size.

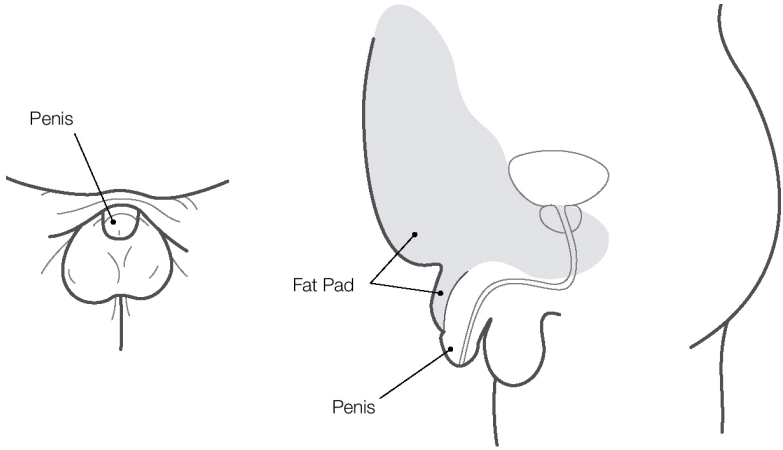


Figure 4 Hidden penis

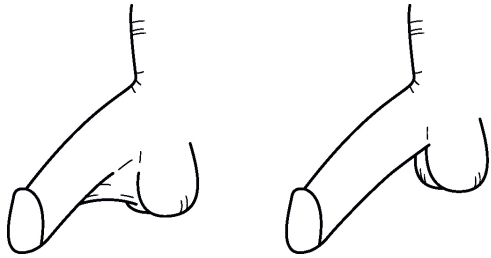


Figure 5 Webbed penis

Micropenis

Sometimes the penis is truly smaller than normal. The criterion for **micropenis** is a soft but stretched penis that is 2.5 standard deviations below the average. What this means for a newborn is a stretched penis shorter than 1.9 cm. The sizes can vary slightly with ethnicity (see Table 1).

Table 1: Average Penis Size by Age

AGE	MEAN CM ± SD	MEAN * SD
Newborn 30-week gestation	2.5 ± 0.4	1.5
Newborn 34-week gestation	3 ± 0.4	2.0
0 to 5 months old	3.9 ± 0.8	1.9
6 to 12 months old	4.3 ± 0.8	2.3

1 to 2 years old	4.7 ± 0.8	2.6
2 to 3 years old	5.1 ± 0.9	2.9
3 to 4 years old	5.5 ± 0.9	3.3
4 to 5 years old	5.7 ± 0.9	3.5
5 to 6 years old	6 ± 0.9	3.8
6 to 7 years old	6.1 ± 1.0	3.9
7 to 8 years old	6.2 ± 1.0	3.7
8 to 9 years old	6.3 ± 1.0	3.8
9 to 10 years old	6.3 ± 1.0	3.8
10 to 11 years old	6.4 ± 1.1	3.7
Adult	13.3 ± 1.6	9.3

Micropenis happens when the male fetus's testicles don't produce enough testosterone during that critical window of penis development early in pregnancy. The testicles don't make testosterone unless they receive a signal from the brain, so genetic conditions that inhibit brain signals can cause micropenis. In **Kallmann syndrome**, the part of the brain that signals the testicles is not formed. This often goes hand in hand with a lack of a sense of smell because the "smell" nerves are right next to the part of the brain that secretes the signal, so those nerves don't form either. In **Klinefelter syndrome,** the boy has an extra X chromosome, which results in very poor testicle growth and development. In some cases, these boys will not produce adequate testosterone for normal penis growth. A newly increasing cause of micropenis may be environmental toxins, such as pesticides and heavy pollution, which mimic estrogens. Estrogens counteract testosterone during the critical window of penis growth and development early in the pregnancy.[5, 6]

The treatment of micropenis is to immediately supplement the missing testosterone with topical testosterone gel or injections. The trick is not to give too much, or the bones will stop growing longer and the boy's height will be stunted. Still, the gains may not be enough, and so one of a variety of surgeries can be performed.

The penis suspensory ligament that anchors the base of the penis shaft to the underside of the pubic bone can be cut, allowing the penis to hang a little longer. The scrotum can also be tapered back. These changes make the penis appear bigger. Another surgical fix is adding tissue flaps around the penis to increase girth. There is very little that can be done surgically to

increase the length of the erectile chambers of the penis. In extreme circumstances, a new penis can be developed, but this is rarely done as the vast majority of men with micropenis have fulfilling intimate sexual relationships. For some, the condition can be a source of great distress. It is thought that Napoleon Bonaparte had micropenis, which gives a whole new dimension to the notion of overcompensating.[7]

Megalopenis

On the other end of the spectrum is **megalopenis**. No, it's not the newest B-movie craze since *Sharknado*. As the name suggests, it's a penis that is bigger than normal by more than 2 standard deviations. In some cases it is due to abnormal genes that cause many other physical, and often mental, defects. In most cases, the cause is too much testosterone stimulating the developing penis, which may be due to a tumor in the testicle overproducing testosterone. This kind of tumor is usually benign. Sometimes there are tumors in other parts of the body that make testosterone or regulate its production. There may be a tumor in the adrenal gland or the pituitary gland, which is the control center for normal testosterone production. Sometimes the testosterone is from medicated gels or ointments that get on the baby from someone else who's using them. Too much testosterone causes the bones to stop growing too soon and stunts the child's growth, so the testosterone levels need to get back to normal ASAP. The penis will eventually get back to normal, too. Ah, shrinkage—but in a good way.

Switch Hitters

Boys will be boys—or maybe not. Hormones, environmental pollutants, and even stress all influence the gender of the developing baby. There is evidence that the brain itself can be either male or female. Some scientists say that there is an area of a boy's brain that makes him more interested in toys that can be propelled, while a girl's brain is wired more toward nurturing toys.[8] There are also theories about differences in learning styles and strengths—men being hardwired to be better at spatial reasoning, for instance. Of course, societal pressures are at work

here as well, so there is a lot yet to understand about brain gender. For boys, the key element that shapes the brain is testosterone. It strengthens some brain connections and pares down others.[9]

When brains of the deceased were studied for gender differences, there was a clear difference between men and women in the size of the bed nucleus of the *stria terminalis*, a key center linked to gender. It was bigger in men, and the difference seems to finalize in early adulthood, long after the window of influence of hormones or medications on the growing fetus or infant. In another study, several brains were studied that were from male-to-female transsexuals, and in every case, the brain center size corresponded with that in females. In a female-to-male transsexual's brain, this area was the size of a male's. Interestingly, when the specimens from adults who were exposed to high levels of the opposite sex's hormones were examined, there was no effect on this brain center's size. This brain center is hardwired and seems to be a determinant of whether you feel like a man or a woman, and whether you are unfortunate enough to feel that you are in the wrong body.[10, 11, 12]

This recent understanding about brain sex raises a question about performing surgery to create female genitals for males born with atypical genitals or to create female genitals on females born with male-like genitals. The brain gender doesn't always match the body, but it's much harder to reconstruct male parts—outies—than female parts—innies. There is a movement to defer these complicated decisions until the child is old enough to make the decision. This may seem straightforward, but in some cases the reconstruction of the pelvis and urinary tract is a matter of life and death and surgery of the genitals must be decided on immediately. Sometimes the gender of the child will be out of sync with the genitals, making navigating gyms and public bathrooms a challenge. For some, early surgery provides a welcome normalcy to childhood and adolescence.[13]

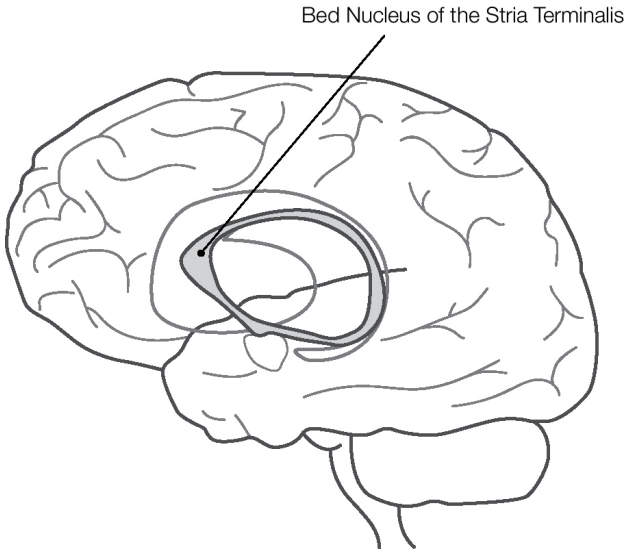


Figure 7 Deep brain center determines what gender you feel like

Gender Identity Disorder

Gender identity disorder (also now known as **gender dysphoria**) is defined as "the desire for at least 2 years, to live and be accepted as a member of the opposite sex, usually accompanied by the wish to make his or her body as congruent as possible with the preferred sex through surgery and hormone therapy."[14] This condition is finally being recognized as a legitimate and common problem. The underlying cause is not likely a "choice," but rather a brain gender issue. It is estimated that more than 15 million people worldwide feel like they were born with the wrong goods.[15] This is much more of an issue for men than women, at a rate of about 4 to 1, although women haven't been asked as much, so the true difference could be less.[16]

So what's a girl/boy to do? Now that gender dysphoria has been recognized, treatment has become more widely available. These trans men and women are no longer as "trapped" in their bodies as were their predecessors. Modern surgical techniques, coupled with carefully monitored hormone therapy, have enabled transgender people to achieve emotional and psychological relief and satisfaction with their bodies.[17, 18] Caitlyn Jenner is

currently the most famous transsexual, having transitioned from Gold Medal Olympian and Kardashian stepdad Bruce Jenner. She writes in her memoir, *The Secrets of My Life*, "The surgery was a success, and I feel not only wonderful but liberated." This is the sentiment of more than 80 percent of trans men and trans women who undergo gender reassignment surgery.[19] Still, it's a very big step and not taken lightly. Candidates for surgery must demonstrate that they really need it because it's permanent, costly, and high stakes from the standpoint of risks, complications, and recovery.[20]

Gender reassignment surgery does not just involve giving the jewels a new setting. Adult men and women have other gender-typical body parts that may be surgically adjusted, including the face, the larynx (Adam's apple), the chest, the breasts, and the distribution of fat. Women becoming men typically undergo surgical removal of their internal reproductive organs. Many of these gender body differences are influenced by hormones during teenage growth and development. More attention is now being directed towards teens and preteens who identify as the opposite sex to make their transition easier with hormone therapy so these changes are not as profound and may not require surgery. In many cases, blocking the hormone surge of puberty may be an effective and compassionate intervention, as it allows the child with clear-cut gender dysphoria to sidestep the anguish of hormonal puberty in a body that doesn't match his/her brain while allowing more time to become certain about a decision for surgery.[21]

At the Swap Meat

As far as the actual genital gender-bending goes, it is easier to make a vagina than a penis. After all, much of the *neovagina* (*neo* means "new" in Latin) is hidden. The *neopenis* is out front for easy scrutiny. Neovaginas are most often made from the very skin that makes the penis, but it is inverted, like pushing in a belly button. The two chambers that fill with blood to create an erection are removed. The head of the penis is reduced in size but most of the nerves are preserved, and it is then positioned at the top of the inverted-penis-now-vagina. The scrotum is surgically divided in half and so is the perineum (the space between the scrotum and

the anus) to remove the testicles and to make space for the new vagina. Each half of the scrotum is altered to resemble labia. There is also some shortening and repositioning of the urethra to enable voiding while seated. This neovagina has sensation, and the person can still orgasm. It has a tendency to contract and become narrowed, so regular use of a dilator and lubricant is recommended. If the penis skin is not adequate to be inverted, a segment of large intestine can be removed and used to create the neovagina.

There are several techniques surgeons may use when faced with the daunting task of creating a penis. A penis, after all, isn't just for show. It's got waterworks and needs to rise to the occasion. The goal for a neopenis is for its owner to be able to pee standing up, penetrate sexually, and have sensations of sexual pleasure. A common technique is to use a large flap of tissue from the forearm or thigh and make a tube within a tube for the urethra and the penis. An inflatable penile implant is put inside the neopenis, and testicle implants are put inside the labia, which are sewn together in the middle to mimic a scrotum. The flap has a nerve and blood vessels that can be connected to the nerves of the clitoris and the blood vessels of the abdominal or thigh muscles.

In other variations, a flap of skin fat and muscle may be taken from the side of the chest, but without disconnecting the nerve so that the muscle can still be contracted in order to make the neopenis "hard" for sexual penetration. If sex is not a priority, the clitoris can be surgically detached from the underside of the pubic bone, dropped down, and enlarged. The urethra is surgically lengthened with some nearby tissue and the labia are altered to mimic a scrotum with testicle implants. This neopenis is adequate for urinating standing up but not for sex; however, sexual sensation is not affected because no nerves are cut.

These are complex surgeries and are often done in stages. The typical saga will last from 1 to 4 years, usually with complications. Strictures or leaks can occur where the natural urethra is connected to the neourethra (new urethra). Implants can get infected or erode. Sensation may not be satisfactory, and there is also the risk of infection or even injury and loss of some tissue. The worst complication may be a change of heart. This is rare, but even in this scenario, there can be second chances in the

hands of a skillful surgeon.[22]

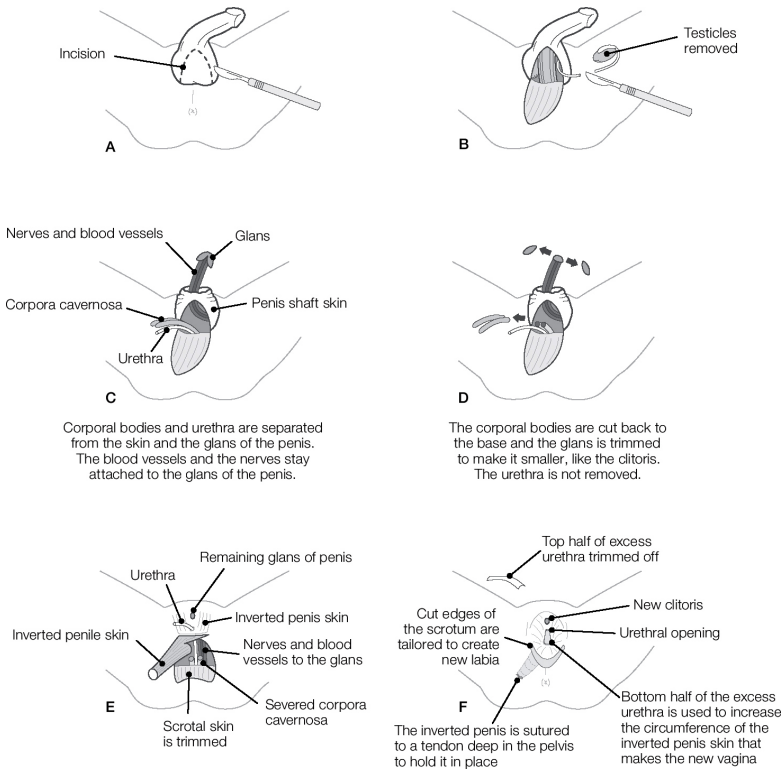


Figure 8 Male-to-female gender reassignment surgery

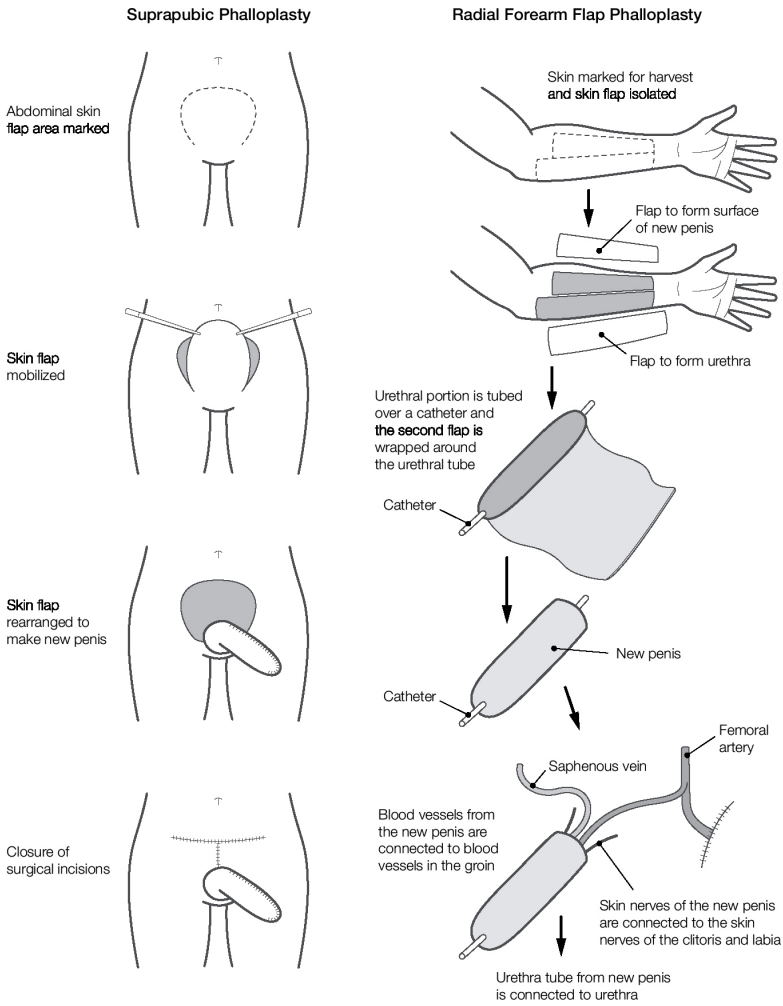


Figure 9 Female-to-male gender reassignment surgery

The Ultimate Gift

Penis transplantation is now a reality, but it is reserved for victims of trauma, injury, or cancer. The first recipient, a Chinese patient, actually had his removed 2 weeks later due to a severe psychological reaction, but the second, a 21-year-old who lost most of his penis in a catastrophic circumcision complication, went on to father a child. The third recipient was the first in the United States and had lost most of his penis to cancer. He paved the way for a research team at the Johns Hopkins University,

which has subsequently performed penile transplantations for wounded veterans. These transplants must be agreed to by the family of the donor. The costs are high and lifelong immune-suppressing medication is required, but for the recipients, it can be a miraculous gift.[23]

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Thank you to all my patients, from whom I learn every day and who allow me the privilege of participating in their care. I wish I could spend with each of you the time I have dedicated to explaining your conditions and your remedies in *The Penis Book*. This book is truly for you.

About the Author

Aaron Spitz, MD, is a leading expert in male sexual health and fertility. He has served as an assistant clinical professor at UC Irvine's Department of Urology for 15 years. He is the director of male reproductive and sexual medicine at Orange County Urology Associates. He serves as the lead delegate representing all of America's urologists to the American Medical Association, and he has served as the president of the California Urological Association. He has appeared on *Dr. Phil* and *The Real Housewives of Orange County* and is a regularly featured expert on *The Doctors*.

This book is intended as a reference volume only, not as a medical manual. The information given here is designed to help you make informed decisions about your health. It is not intended as a substitute for any treatment that may have been prescribed by your doctor. If you suspect that you have a medical problem, we urge you to seek competent medical help.

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